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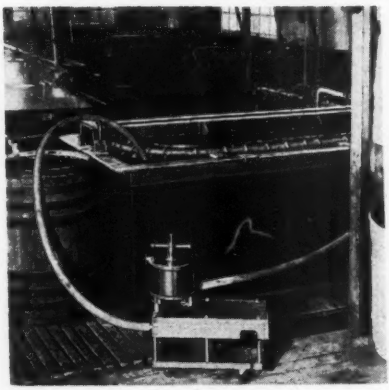

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ILLUSTRATION

The illustration shown is the Hotel Statler at Buffalo. This will be headquarters for the 31st A.E.S. National Convention, June 7, 8 and 9.

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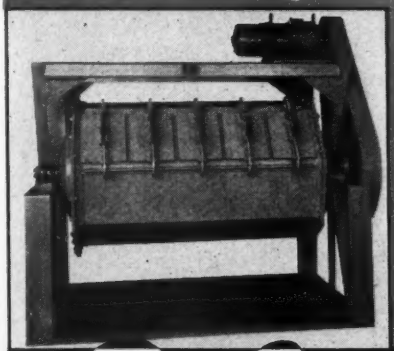

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The Fundamentals of Electrochemistry and Electrodeposition

Part XIX. The Behavior of Anodes: Passivity

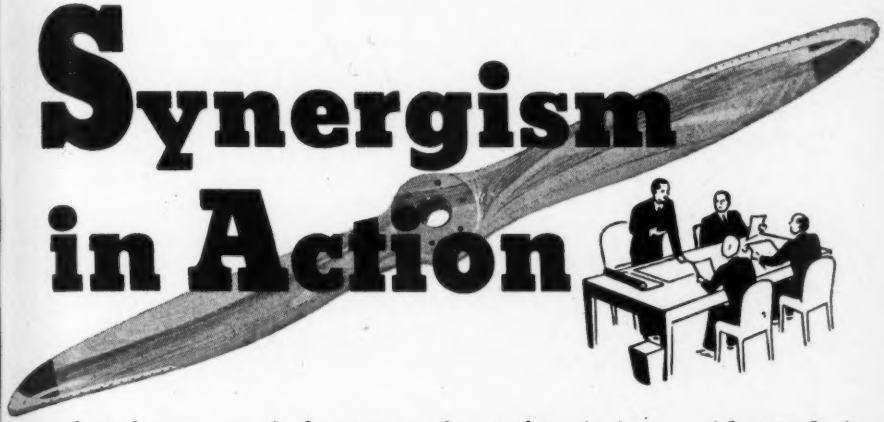
By SAMUEL GLASSTONE, D.Sc., Ph.D.
Professor of Chemistry
The University of Oklahoma, Norman, Okla.

SOLUBLE AND INSOLUBLE ANODES

ALTHOUGH every electrolytic cell must have an anode and a cathode, the treatment in the previous articles has dealt almost entirely with the behavior of the cathode. The reason for this emphasis is that the prime problem of the electroplater is to produce a satisfactory deposit on the cathode with a high current efficiency. However, the anode must not be ignored, because it obviously plays an important part in the electrolytic process, although its effect on what happens at the cathode is more indirect than direct. There are two main types of anodic behavior to be considered; first, there are the soluble anodes, such as nickel, silver, cadmium, zinc, tin, etc., used in the plating of these metals, and second, insoluble anodes such as are employed in chromium plating. Among the problems to be considered are the following: how can a soluble anode be maintained in the proper state so that it dissolves as required, and, on the other hand, what causes an anode to become insoluble? These problems are closely bound up with the phenomena of "passivity", and so it is proposed to deal with this topic in the present article.

If the anode is soluble, it should dissolve under the influence of the current exactly in accordance with the requirements of Faraday's laws (see Part V). In other words, the passage of 96,500 coulombs (amp.-secs.) or 26.8 amp.-hrs. should cause 1 gram-equivalent of the metal anode to dissolve, just as this quantity of electricity causes the same amount to deposit on the cathode. For an ideal electrolysis, therefore, in which the anode is of the same material as the metal deposited on the cathode, and the efficiency is 100 per cent at both anode and cathode, the same amount of metal will dissolve at the anode as is plated out at the cathode. The net concentration of the bath will thus remain unchanged; some form of agitation, or stirring, is required of course so as to keep the solution

Synergism in Action



Synergism is new to industry, perhaps, but it is an old word that has acquired a vital new significance for today and the days ahead.

SYNERGISM, meaning forces working *together* to produce more than the sum of both working *separately,* can literally make 2 + 2 equal 5. True 2 apples plus 2 apples do not make 5 apples but an apple grower plus a chemist may make possible many more apples from the same trees and land.

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mixed. The prime object of using a soluble anode, therefore, is to maintain the concentration of the bath approximately constant, at least as far as the ions that are being deposited, e.g., silver, copper, etc., are concerned.

Although it is desirable in the cases mentioned in the previous paragraph to employ an anode which dissolves with 100 per cent efficiency, it is not always a simple matter to achieve this in practice. For example, it is often found that a silver anode in a cyanide bath becomes covered with a dark colored coating, and then ceases to dissolve almost entirely. At the same time there is a considerable increase in the bath voltage. The explanation of this behavior probably lies in the fact that as the silver anode dissolves under the influence of the current, there is an accumulation of silver ions in its vicinity. These ions combine with the cyanide ions to form the complex argentocyanide ions; as a result, however, the cyanide ions are used up to a considerable extent. If these cannot be supplied, by diffusion, etc., as fast as they are removed, that is, as fast as the anode dissolves, the insoluble silver cyanide (AgCN), or some similar insoluble product, will form a coating over the anode. Since this coating is a non-conductor, it will have a high resistance, and consequently the bath voltage will have to be increased. Further, since the coating covers a large part of the anode, the latter is largely prevented from dissolving. The difficulty that arises in this way with a silver anode in a cyanide solution can be overcome by providing a good supply of cyanide ions, and this is most easily achieved by having a fair excess of free cyanide ions in the electrolytic bath. This is one of the reasons, although not the only one, for the use of an excess of free cyanide in complex cyanide baths.

MECHANICAL PASSIVITY

The case just considered is an illustration of the phenomenon of passivity; a passive anode is one which ceases to dissolve completely, or to a great extent, under the influence of the applied voltage. The type of passivity observed with a silver anode in cyanide solutions, is sometimes referred to as "mechanical passivity", because the passivity is evidently due to the mechanical blocking effect of a visible film of some non-conducting material. Another instance of mechanical passivity, accompanied by certain effects of a different nature to those obtained with silver, is to be observed with a lead electrode in an electrolyte containing sulfuric acid. Such an anode does not dissolve to any appreciable extent, for it is almost immediately covered with a layer of insoluble lead sulfate. However, the layer does not remain in this form, for as the voltage is increased the lead sulfate becomes oxidized to the dark brown lead dioxide (PbO_2).

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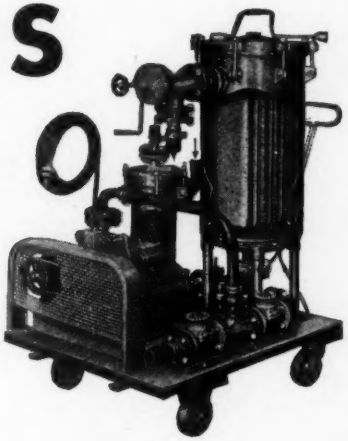

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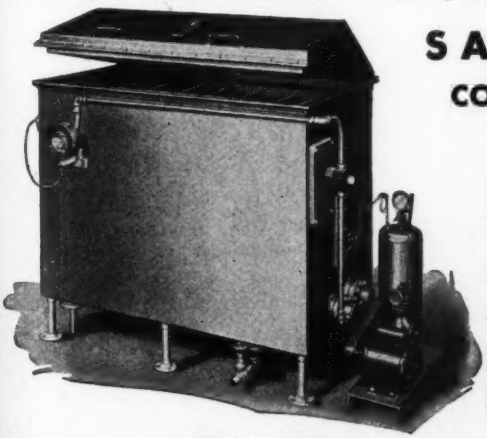

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This is in fact the same process as occurs in the lead storage battery. The interesting, but unusual, fact about the lead dioxide is that it is a good conductor of electricity; hence, although the layer of this oxide is quite thick, and can be seen with the naked eye, it exerts very little resistance to the passage of current. The result is that the lead electrode now behaves as a lead dioxide anode; the lead does not dissolve, neither does the dioxide, unless the sulfuric acid is rather concentrated, but the passage of current is accompanied by an oxidizing action of some kind, or by the liberation of oxygen gas. The lead anode in sulfuric acid solutions can thus function as a satisfactory electrode, because of its low resistance, while at the same time it is practically insoluble.

LEAD ANODE IN CHROMIUM PLATING

The properties of a lead anode described in the previous section are made use of in connection with chromium plating. In the ordinary chromic acid bath there is little hope of employing a soluble anode that will maintain the concentration of the bath almost constant. It is therefore the universal practice to use an insoluble anode and to make up for the chromium removed in plating by the addition of fresh chromic acid from time to time. In this way the presence of impurities that would arise from the use of a soluble anode is avoided. The insoluble anodes employed are generally made of lead, or a lead alloy, which becomes converted to lead dioxide, as described above. Incidentally, such anodes have another function, besides that of mere insolubility, in the chromium plating bath. At the cathode some of the chromic acid is reduced to the form of chromic ions, and the lead dioxide anode, since it has strong oxidizing properties, converts them back to chromic acid. In this way a possible source of loss is avoided.

ELECTROCHEMICAL PASSIVITY

One of the most interesting types of passivity is often referred to as "electrochemical passivity"; it occurs, particularly, with the metals iron, nickel and cobalt. In this case there is no visible sign of a coating on the anode, yet the metal ceases to dissolve and oxygen gas is evolved at a high potential. Electrochemical passivity of nickel and the related metals occurs when a sufficiently large current density is applied to an anode of the given metal. Up to a certain point, which depends on the conditions, the nickel dissolves exactly in accordance with the requirements of Faraday's laws, but beyond this point the E.M.F. rises, the current tends to drop, the nickel ceases to dissolve almost completely, and oxygen is evolved. Without going into details of the theoretical arguments, it may

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be stated that it is now generally agreed that electrochemical passivity is due to the formation of a very thin, invisible, film of oxide on the surface of the anode. The film is sufficiently adherent and coherent to prevent the metal dissolving, in spite of its being so thin, but because it is thin it does not have a high resistance, and so it does not impede the flow of current. Since the nickel cannot dissolve, the discharge of hydroxyl ions, with the evolution of oxygen gas, must occur instead. The anodic passivity of iron, nickel and cobalt can be inhibited by the use of relatively acid solutions, by agitating the electrolyte, by raising the temperature and by preventing the C. D. from becoming too high. It is also an important fact, the reason for which is not clearly understood, that chlorides are able to prevent the nickel group of metals from becoming passive.

AVOIDANCE OF PASSIVITY IN PLATING

In the plating of nickel it is desirable that the anode should continue to dissolve and not become passive. The conditions are therefore adjusted so as to inhibit the onset of passivity, as far as possible. In the first place, nickel baths invariably contain some chloride ions, in the form of nickel chloride or ammonium chloride, the solutions are warm, there is some agitation, and the pH is adjusted so as to give as much acidity as is reasonable without causing a loss of efficiency by the evolution of hydrogen at the cathode. Further, the anodes are made either with a flat or oval cross section, or in the form of small spheres; this makes the surface as large as possible for the given amount of metal, and so reduces the anodic C. D. All these factors favor the anode retaining its activity.

EFFECT OF ACIDITY AND ALKALINITY

It should be noted in conclusion that the conditions under which an anode becomes passive varies with the nature of the metal. Some metals, like iron, nickel, cobalt and chromium, become passive most easily in solutions of low acidity; on the other hand, tin, molybdenum and tungsten are more active in such solutions and only become passive if the alkalinity is low. These facts are connected with the solubility of the oxide films that form on the anode and that are the cause of passivity. If the oxide is soluble in acid, but insoluble or slightly soluble in alkali, as with nickel, etc., passivity is favored by an increase of alkalinity and a decrease of acidity. However, if the reverse is true, and the oxide is less soluble in acid and more soluble in alkali, as with tin, etc., increase of acidity will facilitate the onset of passivity.

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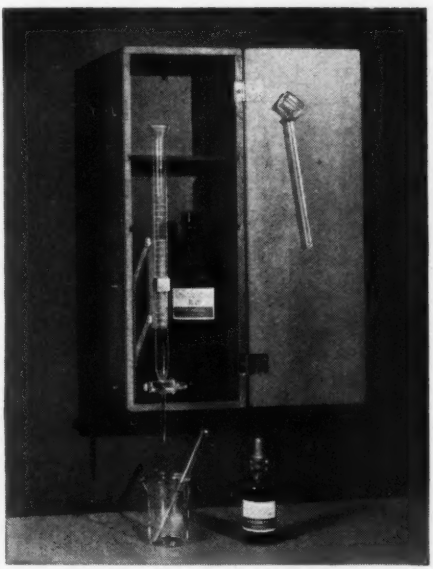

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Improved Apparatus for the Determination of the Thickness of Metallic Coatings by Jet or Drop Methods

By W. B. STODDARD, JR.

DETERMINING the thickness of electrodeposited metallic coatings by jet or drop methods is not new. The fundamentals, constants, and manipulations of such processes already have been worked out. Stated briefly, a corrosive solution is allowed to flow onto and attack a given area of the metallic film. In a short time, depending upon the thickness of the film, a hole develops through which is revealed the substance upon which the electrodeposit was made.

It is the purpose of this paper to point out certain errors and awkwardnesses of these methods as now practiced, and to suggest ways and means for eliminating these defects.

Since time is the measured variable upon which depends the final result, it is necessary to determine time accurately, generally with a stop watch.

Errors in timing are inescapable, since it is not possible to precisely coordinate the opening and closing of a stopcock to control the flow of the corrosive solution, and the starting and stopping of a stopwatch to time this flow. Obviously, the greater the number of interruptions to judge the endpoint, the greater the cumulative error in timing.

Most of these methods require that the rate of flow be kept within certain limits and for this purpose constant level devices are resorted to so that the equipment may be used for a reasonable length of time without refilling. Such an arrangement is apt to be cumbersome and to require rather careful adjustment at frequent intervals.

The handling of corrosive solutions requires special care, and any design in equipment which will facilitate or diminish the amount of handling necessary should be worth the effort put into its development.

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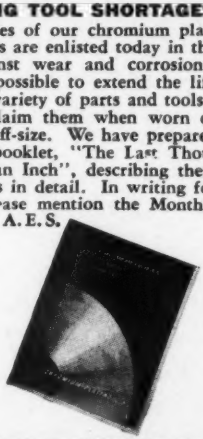

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The following points seem to be pertinent:

1. The timing should be simplified to reduce errors.
2. The changes in the rate of flow of the solution should be kept within narrow limits.
   a. Frequent manual adjustments of the flow rate should not be necessary.
3. Particular attention should be paid to the following having to do with the handling of solutions:
   a. Filling and refilling the apparatus should be made easy.
   b. Automatic filtration should be provided for all solutions.
   c. For those solutions which have a large temperature factor, a thermometer should be integral with the solution reservoir.

It was with these points in mind that the equipment now to be described was developed. Fig. 1 is a cross sectional view of the equipment. The following is an explanation of its operation: Bottle A is filled with solution through the opening B which is shown plugged with stopper C carrying thermometer D, after which the stopper C with the thermometer is replaced.

Air pressure is now applied through E by means of an atomizer bulb, with a finger held over hole F. The solution is forced through glass wool filter G, up through tube H, and out of opening I. Soon the level in the burette J is above I. By opening hole F, the pressure is released and the excess solution in burette J siphons back through I and H into the bottle A, automatically adjusting the liquid in the burette J to zero level.

The obvious convenience of handling and regulating liquids by such methods has long been recognized. Filter G insures the delivery of dirt-free liquid to the burette. This is important.

By opening stopcock K a jet of liquid flows from orifice L. This orifice is the heart of the instrument.

For example, one solution for the determination of copper thickness described by S. G. Clarke in Metal Industry, London, Vol. 49, pages 419-422, 1936, is as follows:

$FeCl_3\ 6H_20$	150 grams per liter
Sb_20_3	20 grams per liter
HCl (sp. gr. 1.16)	200 cc per liter
Glacial acetic acid	250 cc per liter

This solution operates normally at 25° C. Generally the rate of solution flow is adjusted to about 20 cc per minute.

It has been found fairly easy to grind the orifice L in stopcock K to give a flow of this solution of 20 cc per minute at 25° C. starting with the burette at its automatically-controlled zero level.

This grinding is accomplished as follows:

1. The orifice is fused shut over a gas burner, taking care to keep the tapered channel in the stopcock delivery tube from bending.
2. The closed, tapered channel in the stopcock delivery tube is now ground open on fine emery paper. The cut should be made at right angles to the channel.
3. This grinding is continued until the opening which has been made will deliver 20 cc of the liquid at 25° C. in one minute, starting with the level in the burette at zero.

Note—Dirt and air should be removed from the flow channels before testing.

After an orifice is produced which will deliver the correct volume of solution in the right time at the proper temperature, the instrument may be used with a stopwatch in the ordinary way; but to do this would be to overlook entirely the greatest advantage to be gained from this equipment.

It is obvious that if the burette will deliver 20 cc in one minute, then it is in effect a timing device itself. Moreover, by proper calibration the stopwatch can be eliminated and the calibration scale can be made to read either in seconds or directly in thickness units. The elimination of constant stopwatch manipulation will help to reduce errors.

One method by which the burette may be calibrated in metal thickness units is as follows:

1. With the proper solution in the burette, a thin strip of paper is glued to the upper portion so that it extends above the zero level and about one-quarter of the way down the burette.
2. A point is marked on the paper to indicate zero level.
3. Another point is made indicating the level after fifteen seconds flow at the proper temperature, as timed from zero level by a stopwatch.
4. Other points are recorded on the paper strip at 30, 45, 60, etc., seconds, each reading being taken from zero level.
5. The distance between points on the paper strip is accurately measured.
6. A graph, Fig. 2, is made plotting time of solution flow in seconds against distance from zero level to the corresponding points on the paper.

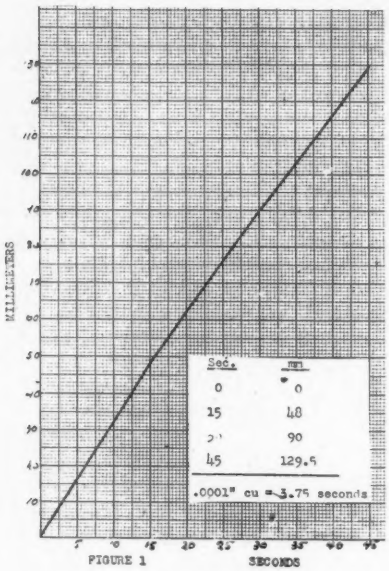

FIGURE 1

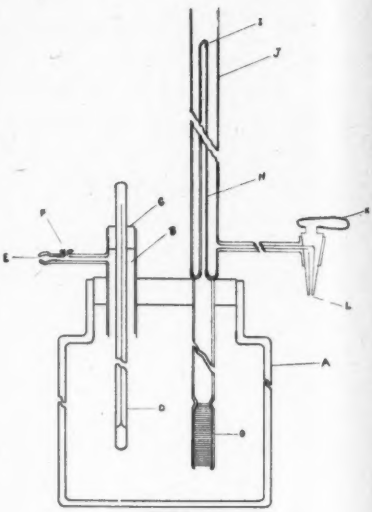
FIGURE 2

7. On the curve thus produced, points corresponding to the thickness of metal can be determined. For example, 1/10,000 inch copper equals 3.75 seconds equals 12 mm from zero level.
8. A second paper scale is carefully made having lines to indicate various thicknesses of metal as determined in 7.
9. This scale is glued to the back of the burette so that zero on the scale corresponds with zero level in the burette. After this the burette may be used without a stopwatch since the scale has been made to read directly in metal thickness units.

Notes.

1. The scale divisions toward the bottom of the scale will be slightly closer together than at the top. This results from a lower rate of flow as the level in the burette drops.
2. Greater accuracy in obtaining the true curve of time against distance from zero can be had by shorter timing intervals, thus getting a greater number of distance points.
3. The effect of change in the rate of flow is minimized if the burette is made high enough so that only a fraction of its total length is used. For example, the scale on burette in Fig. 3 is about 105 mm long, while the burette itself is about 28 inches high.

4. It is best to maintain the temperature of the solution at the right value in making measurements, although correction tables are available for converting one thickness result at the correct temperature to another thickness at a different temperature.

5. Errors are caused if the stopcock is not wide open at all times that the solution is flowing. This applies for grinding the orifice, calibrating the burette, and making measurements.

6. Air bubbles or dirt will interfere with the flow, resulting in errors.

7. Dark-colored solutions, difficult to see through, are best used in a modified burette shown in Fig. 3. This burette has a thin tube parallel to the main burette to make more easily visible the scale and the true level of the solution meniscus. The small tube is used both for calibration and measurement. Where a transparent scale is engraved on the front of the burette, this additional tube can be dispensed with.

8. The equipment may be modified in size and form depending upon the requirements.

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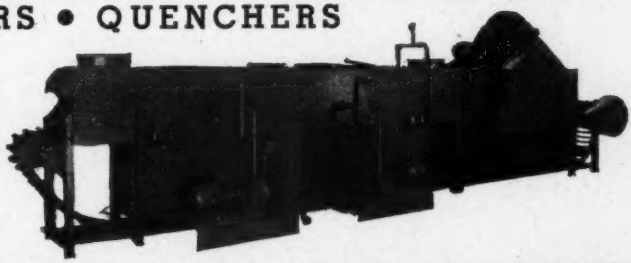

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Second Annual Photographic Display of the A.E.S. 31st National Convention

June 7, 8, 9, 1943. Buffalo N. Y.

By C. C. HELMLE
Chairman of Exhibits

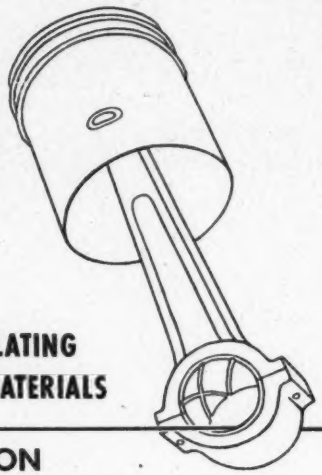
THE acceptance accorded the First Annual Photographic Display of the A.E.S. in 1942, and the favorable comments received encourage us to carry on again this year. We do so with the aim of increasing the participation, particularly, with respect to Branch Exhibits. This year, more than ever before, every member owes it to his Society to make the 1943 Convention the most *useful*, most enlightening, most necessary meeting ever held by the A.E.S. One way of contributing to the realization of these objectives is to enter the Photographic Exhibit. Our goal is at least one exhibit panel from each Branch.

In order to inject and further a competitive spirit among the Branches there will be a judging of Branch displays in addition to the selection of individual winners in each division.

The rules have been planned to permit individuals to make their pictures a part of a Branch Exhibit and still enter them for individual competition. On the other hand there are many persons who, for one reason or other, may not care to enter individual competition but who have something which might contribute to making their Branch exhibit interesting and educational. Such persons are not required to enter individual competition in order to make their contribution a part of their Branch display.

The Convention Committee suggests that each Branch appoint a local committee chairman to receive, compose, mount, and ship the Branch Exhibit. If it is not possible for a Branch to enter an exhibit, any of its members desiring to make individual entries may send their mounts directly to the Convention Committee's Chairman of Exhibits. This will also apply to Manufacturers' and Suppliers' photographic exhibits of equipment and processes.

*HARSHAW'S SILVER CYANIDE
*HARSHAW'S SILVER CHLORIDE
*HARSHAW'S SILVER NITRATE



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Harshaw's Silver Cyanide, Silver Chloride and Silver Nitrate are carefully manufactured under strictly controlled conditions for rapid dissolving qualities, unusually high purity, and high silver content to give you smooth deposits that are uniform in both color and texture.

QUICK FACTS ABOUT HARSHAW'S SILVER PLATING SALTS

SOLUBILITY

Physical characteristics of the particles are especially developed to dissolve quickly and easily.

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Metallic silver averages from 80.2% to 80.4% in Harshaw's Silver Cyanide . . . 75.1% to 75.3% in Silver Chloride . . . 63.4% to 63.5% in Silver Nitrate.

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HARSHAW

*

The Branch exhibits may include any or all, except number one, of the following divisions which are made primarily for individual competition.

1. Manufacturers' and Suppliers' Photographs of Equipment and Processes.
2. Photographs of Finishes (parts and production technique).
3. Human Interest.
4. Still and Animal Life.
5. Landscapes, Views, Gardens, Flowers, Architecture.
6. Hobbies, Table Top Photographs (miniatures).
7. A.E.S. Conventions.
8. Technical Photographs (photomicrographs and macrographs, pictures of tests or test results, etc.).

INSTRUCTIONS

1. Pictures shall be mounted on white matte finish mounting board with approximately a two-inch margin on all sides. Ace mounting corners will be permissible for mounting pictures. Framed pictures will be acceptable in all cases.
2. Pictures of a related sequence may be mounted on the same card board, provided they are not "crowded".
3. Only pictures by one author may appear on the same mounting card board, except in those cases where there has been collaboration in the production of the photograph.
4. When explanatory remarks are desirable they should be typewritten on white bond paper and mounted in the manner of a photograph
5. In the case of single mountings the title should appear in the lower left corner of the picture on the mount. If two or more pictures are mounted on the same card board the title may appear directly under each picture on the mount.
6. Any number of prints may be entered in one or more classifications.

7. The author should signify his desire to enter or not enter individual competition by placing the following symbols under the title of the picture.

   "E" for entry
   "NE" for non entry

   In case of entry the number or numbers of the division to be entered should follow the "E". For example E 3, 7, will mean "Enter for individual competition in the division for 'Human Interest and A.E.S. Conventions'."

8. The name of the author should appear in the lower right corner of the mounting card board.

9. The author's name and address and classification of entry should be printed on the reverse side of each picture before mounting.

10. All mounted pictures, if they are to be a part of a Branch Exhibit, should be attached to a ¼" thick 3 feet by 4 feet panel of Masonite. The panel should be painted black or black cloth covered and laid out with the board in the vertical position.

11. The name of the Branch should be centered at the top of the panel.

12. Individual mounts and Branch Exhibit panels should be wrapped between full sections of corrugated or fibre board to prevent damage in shipping.

13. The right to reject entries, if necessary, is reserved by the judges.

14. Send all exhibits so that they will be received no later than May 25 to: Chairman, Buffalo A.E.S. Exhibit Committee
    James A. Moneypenny
    Convention Headquarters
    Hotel Statler
    Buffalo, N. Y.

    Address Communications to:
    Chairman, Buffalo A.E.S. Exhibit Committee
    James A. Moneypenny
    314 Washington Ave.
    Kenmore, N. Y.

REMEMBER – TRY TO MAKE YOUR PICTURES A PART OF YOUR BRANCH EXHIBIT. IF YOU CAN'T – DON'T LET THAT STOP YOU FROM ENTERING THE EXHIBIT.

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5. Scrap losses are exceptionally low.

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Some Comments on Zinc Cyanide Plating

By R. J. GREEN

Alsop Engineering Corporation

A ZINC Cyanide bath is one solution most of us have, for one reason or another, shied away from. Then too, Cadmium was plentiful, so why bother with Zinc.

The allocation of Cadimum for essential War needs has brought a lot of folks face to face with the fact that Zinc Cyanide, with all its "headaches," is now the solution of the "hour" and whether we like it or not we apparently have to use it.

Many platers have formed pre-conceived opinions about the operational difficulties of running production in a Zinc Cyanide solution. It must be admitted, however, that these opinions were based on the performance of the early types of Zinc solutions. The troubles encountered in those days were not dis-similar to some of those that are confronting us today.

However, Zinc plating, especially the Cyanide bath, has occupied the "spotlight" for quite some time past. Various research engineers have been more or less quietly working on this type of bath, obtaining some remarkable results.

From the information these men have given out it would seem that Zinc Cyanide solutions are not going to be quite so difficult to operate and control as some of us may have anticipated.

For instance, it was not generally known in the early practice of Zinc

plating that dark, streaky or easily stained deposits could be due to the presence of very minute amounts of copper present in the solution.

Then too, we have found that Cadmium is another metal that if present in a Zinc bath will cause considerable trouble. Small amounts of lead and iron are likewise known to be detrimental to a Zinc solution.

An interesting illustration of how unforseen pitfalls can be encountered in Cyanide Zinc plating, is a case that recently came to the author's attention.

A foreman plater of a large manufacturing concern engaged in fabricating various articles made from wire found his Zinc solutions loading up with copper.

The anodes were the electrolytic type and an analysis disclosed the fact that they contained very little copper, not enough to cause the difficulty. The solutions were purified with Zinc dust and activated carbon and thoroughly filtered. After this treatment the solutions would run along for a few days without any difficulty.

Then again the work would come up spotty and so badly stained that even rolling would not brighten it up.

Finally the wire used in fabricating these various articles was itself checked. This particular wire was made of steel, and right there they found the source of their trouble.

The wire manufacturers treated their product with a "liquor dip" (copper sulphate solution) the steel wire, of course, would pick up a coating of copper by the immersion method, and this coating acted somewhat in the capacity of a lubricator for the dies in the wire drawing process and also served as a rust preventative while the wire was in transit and until it was fabricated.

The problem then was to remove this coating of copper before the wire reached the plating tank. This was easily done, the plater merely strengthened his Cyanide dip solution to one pound per gallon and raised the temperature to 150F.

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A two to five minute soak removed all traces of the "liquor dip." This procedure followed with two separate cold water rinsing dips completely eliminated the trouble. A great deal of literature has been published both in our *Review* and other publications on how to deal with metallic impurities in various types of plating solutions.

*O. S. Stocker deserves a good deal of credit for his paper entitled "Chemical and Electro-Chemical Methods for the Purification of Plating Solutions." Stocker states that:

"In a Zinc Cyanide bath metallic impurities, such as lead, copper, tin, silver, nickel and cobalt will cause trouble," and "electrolysis at fairly low current densities of around 2 amps/sq./ft. will be effective in removing of these impurities with good agitation of the solution."

Stocker further suggests, "that most of the metallic impurities can be precipitated with Zinc dust of about one pound per one hundred gallons of solution with subsequent sludge then filtered out."

Armed with the knowledge of how to purify a Zinc Cyanide solution, the thought of operating it does not seem to present much of a problem.

However, the very fact that this bath is so sensitive to metallic impurities indicates that constant vigilance is required if one is to avoid trouble.

Much of the metallic impurities come from the anodes, therefore, great care should be taken in the selection of the anodes. It is said that there are certain types of anodes on the market that are reputed by the manufacturers to be fairly free from metallic impurities and to some extent sludge. Obviously keeping a Zinc Cyanide bath free from metallic impurities is going to require a very high degree of solution clarification.

If activated carbon is used in conjunction with the purifying process,

*O. S. Stocker: "Chemical and Electro-Chemical Methods for the Purification of Plating Solutions." Technical Sessions A.E.S. Convention, Boston, 1941.

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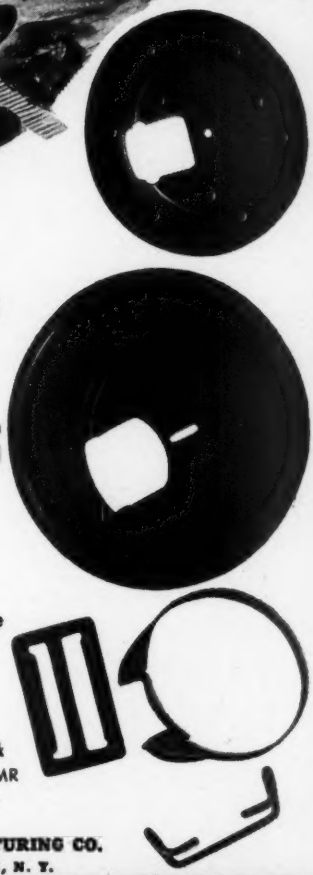

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then positive clarification becomes imperative, because the filtering media must be dense enough to catch and retain the most minute particles of purifying powders if one is to avoid rough nodular work.

Then too, care should be exercised in choosing a filtering machine that will adequately handle this type of solution, inasmuch as it is definitely more difficult to filter than a cadmium or copper solution. Generally speaking, the filter machine should have enough filtration area and the pump should be large enough to turn the solution over at least once an hour.

The axiom, "an ounce of prevention is worth a pound of cure," applied to Zinc Cyanide plating might well read — "several pounds of prevention is worth any amount of cure."

Mention was made earlier of iron as an impurity, one to be strictly avoided, it can be guarded against to some extent by using anodes that are iron free or would contain very little of this impurity.

However, the most prolific source of iron contamination is often overlooked and that is the oxidized iron in the water, used for solution makeup and in additions.

Take a case where the plating department has been shut down over a weekend, the water lies dormant in the pipeline, sediment will precipitate and lie all along the pipe bottom. Then on Monday morning when the valve is opened the surging flow not only sweeps along this new accumulation of iron but washes and scrubs older deposits of rust, growth of algae and other flocculent matter from the pipe walls and floods the cleaners, the rinse tanks and the plating baths with a great deal of unnecessary, and to say the least, undesirable impurities.

Therefore, among the many pre-cautions that must be observed in the operation of a Zinc Cyanide bath or for that matter any other type of plating solution, is the filtration of that most common of all liquids, water. The importance of which cannot with impunity be overlooked or underestimated.

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Pentrate gives a deep black durable rust resistant finish to steel. There is an actual penetration with positively no size change. Bearing manufacturers have found the friction reducing quality of Pentrated surfaces advantageous.

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THE '43 NEW ENGLAND REGIONAL

Sponsored by Bridgeport, Hartford, Springfield, and Waterbury Branches of the A.E.S., the 1943 Annual New England Educational and Technical Conference held at the Hotel Bond, Hartford, Conn., May 1, attracted guests from points as far distant as St. Louis, Mo.

Planned as a Metal Finishing Clinic, the afternoon session was opened shortly after 2 p.m. by General Chairman Arthur Logozzo who welcomed the members. Moderators Dr. Walter Meyer and Mr. C. C. Helmle then took over and introduced the members of the technical panel and their subjects.

Dr. Meyer then introduced the keynote speaker, Mr. Arthur Zavarella, Materials Engineer at the Springfield Armory. In his talk on Ordnance Finishing of Small Arms, Mr. Zavarella stressed the importance of protective coatings and explained the reason for certain specifications which at first might appear to be too rigid. The paper read by Mr. Zavarella showed evidence of extensive research.

Questions were directed to all members of the technical panel, but interest centered in those discussions relating to iron plating. In addition to Mr. Zavarella, the panel members were John R. Thomas, Pratt & Whitney Division of Aircraft, ANODIZING; J. H. Donahue, The Abbott Ball Company, BARREL FINISHING; D. Hartshorn, Enthone Co., BLACK COATINGS ON STEEL, BRASS, ZINC, COPPER; Dr. H. L. Kellner, Lea Mfg. Co., BURRING; Henry Mahlstedt, United Chromium, Inc., HARD CHROME PLATING; H. L. Benner, E. I. Du Pont de Nemours Co., HIGH SPEED COPPER, SILVER, AND LEAD; Ted Wieczorek, The Stanley Works, IRON PLATING; C. R. Watkins, Zapon Co., LACQUERS; Eugene Warden, The Stanley Works, PHOSPHATE COATINGS; Frank Mesle, Oneida Community, Ltd., SILVER PLATING; Harry Sanders, North & Judd Mfg. Co., UNIFORM HARDWARE SPECIFICATIONS; Henry Strow, MacDermid, Inc., ZINC AND CADMIUM.

Harry Sanders also presented an interesting display of war time finishes on various types of small components.

During the afternoon Mr. George Hogaboom gave up-to-the-minute information about current practices and problems in the finishing industry. He also outlined some future problems with which electroplaters will have to cope.

While the men were attending the educational session, the ladies were enjoying a special Victory entertainment program arranged by Mrs. J. H. Donahue and her committee members, Mrs. John Poor, Mrs. Harry Sanders, and Mrs. Al Maynard.

The success of the Conference could not have been achieved without the whole-hearted support of the members of the participating branches. Springfield handled the publicity, Bridgeport solicited contributions from suppliers, Waterbury arranged the educational session and program, and Hartford struggled with the usual problem of providing a banquet for 400.

General Chairman Arthur Logozzo expressed appreciation to all com-

mittees, individual members, and suppliers whose cooperation made the Conference a success. A special acknowledgment is due Mr. W. Johnson of the Manufacturers' Association of Connecticut who secured publicity throughout the state for the affair. The program was then turned over to toastmaster, Mr. J. H. Donahue, who introduced Mr. Lester Smith, chairman of the War Production and Engineering Council. Mr. Smith briefly explained the aims of the twenty-odd engineering societies comprising this Council, of which Hartford Branch, A.E.S. is a unit. Mr. Ellsworth Candee, Acting Supreme Secretary, then responded to Mr. Smith's commendation of the American Electroplaters.

Mr. Alfred C. Fuller, president of the Manufacturers' Association of Connecticut and The Fuller Brush Company, was called on to introduce U. S. Senator John A. Danaher, featured speaker. Senator Danaher paid the Society a distinct compliment in delivering a talk not about general activities in Washington, but about patent developments and their possible effects on the electroplating industry.

This instructive and inspiring address proved that much could be accomplished if views could be more frequently exchanged between similar groups of legislators, business men and workers.

Bateeste, Comedian of W.T.I.C., set the tempo for the evening's fun and was enthusiastically received. George Bowe of W.T.I.C., staged a "Truth and Consequences" show which went over big. Bowe was ably assisted by the following actors: Gene Schimmel, Ralph Maccahn, "Doc" Dubpernell, Mrs. Tom Chamberlain, Bill Seidel, Colin Hastie, Herman Braun, Dick Crain and Mrs. Derick Hartshorn.

Waterbury Branch, led by Carl Kilborn, Ralph Colter, Bert Sage, Wes Cassell, and others, did a bang-up job on the educational program.

Jack Costigan is still unexcelled in preparing eye-appealing advance notices. Jack worked alone on this one and rates the lion's-share of applause.

A special word of appreciation is due Ken Bellinger for his efficient handling of ticket sales and all financial arrangements. Ken is the newly elected president of Hartford Branch.

Hi Goldman and Joe Sterling handled Bridgeport's end by getting the contributions.

Boston, led by Andy Garrett, Art Mintie, Lou Gagnon, Bob Magnuson, Al Jachery, Bill Jones, and many others, lent much to the gathering.

Fred Allen headed the Providence group. New Haven Branch came back to life for a day and it looked like old times with Bob Mooney, John Oberender, Joe Sullivan, Tom Chamberlain, Ed Luther, Al Rosenthal, all very prominently taking interest in all proceedings. Keep it up New Haven — we need you. It was nice to see Vern Julian again. Vern was also an out-of-stater, coming from Philadelphia.

A precedent has been set that must be upheld. The New England Regional is growing — let's keep it moving.

THE COMMITTEE

Zinc—Saboteur of Steel at Elevated Temperatures

By FRANKLIN PAGE, Jr.
San Diego, California
Laboratory Foreman, Solar Aircraft Company

A talk delivered before the Annual Educational Session of the Los Angeles Branch, American Electroplaters' Society, March 20, 1943

THE embrittling effect of molten zinc on stressed steel has long been known, but has received very little publicity. For fifteen years, Solar Aircraft Company has been forming stainless steel with zinc alloy drop hammer tooling. We soon discovered that all zinc "picked up" on the stainless by contact with tooling must be completely removed before welding or heat treating. If this cleaning process is omitted the parts are invariably cracked during the heating cycle. Laboratory experiments, similar to those which you will see in the following movie, demonstrate that when steel is stressed near its elastic limit or its fatigue limit in contact with molten zinc, cracking invariably results. The magnitude of the crack is approximately proportional to the quantity of zinc in contact with the steel and the duration of the heating period. In the motion picture to follow, you will see the rapid formation of a large crack by heating stainless steel to approximately 1400° F. in contact to one milligram of zinc. The steel is bent slightly in a vise to induct strains near the elastic limit of the metal. As the crack develops the vise is tightened to cause the crack to spread sufficiently to be seen in the motion picture. The very minute crack which developed almost instantly is a sufficient stress raiser to cause the failure of an aircraft exhaust manifold, as these manifolds operate at vibration stresses very near their fatigue limit.

Stainless steel is not the only material which will be cracked by zinc in combination with stress and heat. This weakness is found in some low carbon steels, in SAE 2330 aircraft bolt steels, in SAE 4130 steel, and in every other steel and iron alloy which we have tested. Our motion picture demonstrates this effect in the case of an SAE 2330 aircraft bolt.

Because of this effect zinc plating must not be substituted for cadmium

on any steel aircraft part which will operate at a greatly elevated temperature, unless a careful study has shown that the part in question is not subjected to high stresses. Zinc plated parts must not be allowed to contact parts which are to operate under high vibrational stresses at elevated temperatures.

It has been proposed to substitute zinc for cadmium on brackets and other parts which are assembled directly to aircraft exhaust manifolds. Had this substitution been made, failure of both the manifold and the bracket might have resulted after an extremely short service life.

The most alarming substitution is the use of zinc plating on aircraft bolts. It is not our practice to use zinc plated bolts in our product. Others in our industry have assured us that they have taken a similar attitude and are likewise vigilantly guarding against zinc plating. But, we cannot control the bolts used on exhaust manifolds by the airplane manufacturers and by the armed services. Exhaust manifold bolts are usually replaced at every engine overhaul and the mechanic in the field is likely to use any bolt of the right size which is available. If zinc plated bolts are available to him, failures of the exhaust systems in service may result. The failure of the exhaust system can cause the loss of the aircraft and crew.

We have no argument with the substitution of zinc for cadmium in cases where moderate corrosion resistance is the only factor under consideration, but we wish to warn you that zinc plating must not be allowed to contact any part which operates at a temperature above 700° F., and preferably should not be used at all in power plant assembly.

The directives, which ordered the change from cadmium to zinc for bolts, have been protested to the proper authorities. However, these directives have not yet been modified. We believe the very eixstence of zinc plated bolts in field repair stations will lead to their use on exhaust manifolds.

The action of zinc on stressed steel is easily explained. Iron is quite soluble in molten zinc. Iron and steel pots in which zinc and zinc alloys are melted, are dissolved away and have short service lives compared to pots used for melting other metals.

In our experiments we immersed a piece of unstressed clean steel in molten zinc. The zinc uniformly dissolved the steel at a rate which depended upon the temperature. At 1400° F. this rate was very rapid. A piece of steel stressed to nearly its elastic limit in tension was immersed in the molten zinc and immediately shattered due to the extremely

rapid penertation of the zinc along the grain boundaries. Microscopic examination reveals that the zinc very rapidly dissolves the stressed metal in the region of a grain boundary. This is a form of intergranular corrosion and at exhaust manifold operating temperatures very rapidly produces cracks. We have been unable to obtain similar cracking with cadmium.

This talk is to be followed by a motion picture, "Zinc – Saboteur of Steel at Elevated Temperatures," produced by the Solar Aircraft Co.

PROCESS FOR REMOVING PHENOLIC LACQUERS

In the manufacture of steel cartridge cases the surface finish is an important part of the finished product. Special lacquers are necessary, performance specifications of which are embodied in Army Specification AXS-736 (Rev. 1). These lacquers are baked on and the final coating must be resistant to several organic solvents.

When by chance a lacquered case is rejected due to a defect in the lacquer caused by a scratch or thru improper application, the complete removal of the lacquer becomes a problem. Many methods have been suggested using alkaline strippers. All of these, however, call for concentrated solutions requiring considerable time to strip. In many methods the removal particularly on the inside is not complete and the steel case must be scrubbed by hand to remove the lacquer completely.

MacDermid, Inc. have however developed a method for removing this lacquer which is free from the usual difficulties. It employes a low concentration alkali operating at or near the boiling point. The cases are dipped in this for a short time. After this the cases are rinsed and dipped in a non-proprietary solution which removes the last traces of lacquer and furnishes rust protection until the parts can be reprocessed.

All type of phenolic lacquers meeting specification AXS-736 are removed with equal ease. The life of the solutions involved is comparatively long and no harm can result if parts being stripped are allowed to remain in the solution for extended periods of time.

No critical materials are involved in the stripping solutions and ordinary steel tanks with heating coils are the only equipment necessary. For more complete details a process sheet giving all necessary information is available from MacDermid, Inc., Waterbury, Connecticut.

MACDERMID, INCORPORATED, *Waterbury, Conn.*

Papers at the Annual Education Session

American Electroplaters Society
Los Angeles Branch
March 20, 1943

THE first paper on the program was illustrated by a 10 minute technicolor (16 mm.) motion picture film. The talk by Mr. Franklin Page, Jr., of Solar Aircraft Co., San Diego, Calif., is duplicated in the enclosed paper. This is an extremely important subject, of great interest to platers. The object of this paper is to illustrate what dangers lie ahead when zinc is carelessly substituted for cadmium without regard for the ultimate function of the plated part. For example, the use of a single zinc plated bolt to replace the cadmium plated bolts normally employed for fastening stainless steel exhaust collector rings on aircraft engines causes failure of the ring by cracking setting the engine afire and usually resulting in a plane crash fatal to pilot and entire crew.

It is realized, of course, that platers are never in a position to see that their plated work is not incorrectly installed. That is a question of intensive missionary work by qualified instructors at the aircraft plants, aircraft overhaul shops, Army Air Depots and maintenance shops, and Navy Air Stations. It is also a question of convincing the C.A.A., the Army Air Corps and the Navy Bureau of Aeronautics of the seriousness of the new epidemic sweeping the nation, which we might designate "zinc for cadmium substitution disease," and the implications thereof which threaten the lives of their carefully trained personnel as well as the useful service of their expensive bombers and fighters.

Nevertheless, we platers are frequently in a position to know more about the metals that we plate than do our customers, and it is not uncommon for our customers to turn to us for advice on matters in which we can justly speak with authority. The lesson which Mr. Page teaches us interests us because of the universal applicability of his findings, not only to the exhaust collector rings which are manufactured by Solar Aircraft Co., but to any other uses of stainless steel and high temperatures. Let us not loose sight of that. This paper must not be regarded as a rebuke to platers for plating with zinc instead of cadmium and thereby being responsible for the crashing of military aircraft.

Moreover, Mr. Page points out that we can generalize from stainless steels, that the same holds true for mild steel, for special alloy steels, in fact for every steel and iron alloy which he has tested. Furthermore, he points out that the zinc does not require to be bolted to the steel, that merely grazing the steel surface with the zinc plate (like drawing a pencil line) leaves sufficient zinc contamination to cause failure. The failure only takes place on parts subjected to temperatures above 700° F. and need not be taken into consideration if the temperatures never get that high. It is suggested (by this author) that zinc contamination can be effectively dissolved from stainless steel in 20% nitric acid, 20 minutes, 140° F., provided that this passivating treatment is applied before the part is heated to 700° F. alloying temperature.

The technicolor film is to be re-edited and a sound track added. It is understood that this will be available to other branches and we heartily endorse other branches to take advantage of this opportunity and apply to Solar Aircraft Co., S.D., for the use of the film.

The papers by Messrs. Janssen and Dawson, of North American Aviation Corp., Inglewood, Calif., covered the problems of zinc plating as confronted by the user and by the plater respectively. Their papers will be written up, and when passed by the Air Corps censors, will be turned over to the *Review* for publication. Their talks were illustrated by photographs and test specimens showing the influence that zinc exerts upon the corrosion rates of aluminum, dural, steel as compared with cadmium in the salt spray.

Dr. Waterman's talk introduced his convenient handbook, "Graphs and Charts for Electroplaters" which he has copyrighted. Copies of his handbook were printed through the generosity of Turco Products, Inc. and presented to each plater attending the Annual Session. Many of the tedious calculations, cumbersome definitions of electrochemical terms, and important information on plater's chemicals are made simple and quickly accessible. As Dr. Waterman put it in his own inimitable style: "If you know enough about addition and subtraction to be able to make change for a dollar bill, then you can solve any plater's calculation using my handbook." This author remarks that Dr. Waterman introduced a new type of alignment chart in which he is able to correlate six variables: current amperes, surface area square feet, time minutes, specific metal being plated, % current efficiency, and thickness of deposit in mils. For calculating costs from production rate data he has originated another interesting alignment chart. The handbook also con-

tains, believe it or not, a dictionary without words. The definition of electrochemical terms is made via pictures rather than via words. It is hoped that we may again be fortunate to have Dr. Waterman with us to tell us more about how to use this ingenious and entirely original handbook.

Mr. B. G. Daw, of Lasalco, Inc., St. Louis, Mo., in an informal talk presented several worthwhile suggestions on how to utilize our present equipment for increased output. Notable was his suggestion for placing two plating tank in series to better utilize the six volts available from our generators instead of installing additional generators, rheostats and bus bars. The peculiar problems of such a series installation were also discussed by Mr. Daw.

Mr. Harold Acker, of the W. P. Fuller Co. discussed the relationship of metal coatings to organic coatings. An interesting disclosure was the influence of temperature on drying time of paints. In one case cited, the paint shop wanted to speed up drying of zinc chromate paint and to this end installed infra red driers. The high temperatures involved decomposed some of the pigment producing zinc soaps and the paint remained tacky in spite of baking, and never would dry. This was an air drying paint and illustrates how organic coatings, like metal deposits, must be engineered for the process of application.

Mr. W. Paul Sykes, Vega Airplane Co., Burbank, Calif., discussed aircraft processing. The subject was too broad for the short time remaining and consequently Mr. Sykes was unable to treat the subject with the same detail and thoroughness with which he covered "Racking of Parts for Anodizing, Chromatizing and Heat Treating" in a previous paper which he delivered before this branch. Nevertheless there was little or no repetition of what he had covered before and the audience remained glued to their chairs as Mr. Sykes illustrated some clever processing kinks on the blackboard. Mr. Sykes assures me that his talk, which was extemporaneous, will be written up in the near future, and after passing Army Air Corps censorship will be released to the *Review* for publication.

EMMETTE R. HOLMAN, *President*

CONTROL YOUR PLATING SOLUTIONS

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*** "S — DAY" means:**
"Surrender-Day" . . . for the Axis
"Starting-Day" . . . for US

"S – Day" is on the way. Perhaps Sooner than it is wise to let ourselves think.

But it's Sure. It's likely to be Sudden.

Suddenly, we may find ourselves in the midst of another, all-embracing industrial conversion program.

Conversion to PEACE goods. On a scale *just as great* – probably *greater* – than the two-year conversion to WAR goods.

It WON'T be just a conversion BACK to *pre-war ways, pre-war methods, pre-war products.* For every far-sighted manufacturer is already planning, dreaming, preparing – improved models, entirely new products – changed methods of producing them.

We — the members of the American Electroplaters Society — will *need* a new viewpoint, too. For we've learned — in the high-pressure stress of war — that electroplating is *far more* than just a *"luxury-finish"*, to add style and beauty and glamour. We've learned, for example, that plating multiplies the life and efficiency of cutting tools. We've learned that plating can make a steel shell do the work of a brass shell. We've learned that plating can make a tin can better and cheaper. Over and over and over again, we've searched out — and put into WAR-use — applications for plating that justify themselves *solely* on strictly utilitarian grounds.

All the old products we knew before — and a host of new ones — will be hunting for markets. Plating will continue to offer the "Luxury finish" to a Luxury-Starved world. But need we stop there? When we NOW KNOW how to make plating *also* mean money-saving, cost-reducing, efficiency-promoting USEFULNESS, as well?

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Operations in the Spencer Lens Company's plant in Buffalo on which LEA Method and Materials are used in helping to produce Spencer Microscopes, include the following:

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Cleaning
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For example, the body tube of the microscope illustrated is finished with LEA Materials before being enamelled. The bright parts are mostly diamond turned, plated and then buffed.

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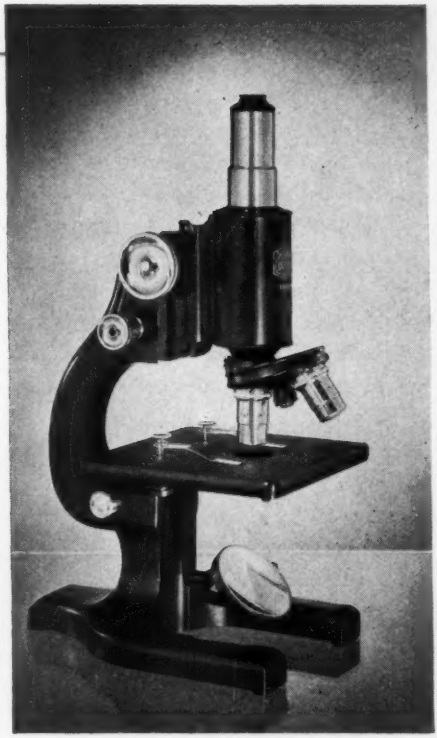

pursuits — if it has a burring or finishing operation, write us about it. In all probability, the LEA Method with properly selected LEA Materials will enable you to turn out a better product at lower cost.

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Waterbury, Conn.

the Development of Production Methods and Compositions

S-LM-S

PROPOSED AMENDMENT TO A.E.S. CONSTITUTION

When any change of importance is to be made it is advisable to balance the advantages against any disadvantage that may occur.

A change in the name of the American Electroplaters Society and of the scope of its interests will result in only one thing—a probable increase in membership.

The membership of an organization can be just large enough to become difficult to control the interests of all, or so large that it is necessary to divide the membership into separate divisions. The former will result in a lack of unity and the latter in the break up of the splendid spirit of unity that exists in the Branches and that is so strongly pronounced at the annual conventions.

Those who have attended A.E.S. conventions have been impressed by the attendance at each and every one of the sessions. There is but one reason for the unified interest that exists at the conventions and that is that the papers read are of definite personal interest and of value to each member.

Change the scope of the subjects that are discussed at the Branches or at a convention and the interests of each group will predominate the meeting which will be the beginning of a decrease in attendance. Papers will of necessity be on subjects that will be of interest to only a part of the membership. This cannot but result in those who are not interested in the subject presented leaving the meeting and that will be the start of the breaking up of that unified interest that makes the A.E.S. conventions successful.

The attendance at Branch meetings will decrease because papers not attractive to all the members must necessarily be presented to satisfy those interested in a special subject.

Of what value will a larger membership be if that membership is to be split into groups? The present scope of the A.E.S., the electroplating and the finishing of metals, has been and still is sufficiently broad to interest the membership as a whole, and yet restricted enough to hold the entire membership in a unit that has brought strength, growth and prestige to the American Electroplaters Society.

Anyone who is a member of some large technical society knows what a difference there is between meeting a few in this or that group and the broad good fellowship of meeting with "all present"; and, while enjoying the papers read and discussed realize that they are in a companionable atmosphere with those having the same interests as their own.

At all the past conventions there has been a full and at times a too full program. There never has been a lack of good papers. An increase of the membership that will demand a more diversified program means that there will be fewer papers on the subjects for which the A.E.S., as an educational society for electroplaters, was organized and which has attracted and interested the very best men in the electroplating industry. Let us hold fast to that which we have.

"In unity there is strength; divided we fall."

GEORGE B. HOGABOOM

DURIRON ANNOUNCES THREE NEW JETS

Three new circulating steam jets have been announced by The Duriron Company of Dayton, Ohio. In addition to being corrosion-resisting, these jets are said to have the advantage of fitting snugly to the inside walls of either square or circular tanks, with a maximum projection of 4½".

The suspended and center discharge types may be used in tanks of any depth. The floor type is adaptable for tanks of any depth up to 60 inches. All types are so designed as to give complete agitation and circulation of the tank contents.

Made of the high-silicon iron alloy Duriron or the special stainless steel Durimet, they are highly efficient for heating acid solutions, dissolving powdered or lump chemicals, and for the digestion of ores and separation of sludge acids.

TWO CENTRAL REGION OFFICES OPENED BY DETROIT REX

W. W. Davidson, Vice President and General Sales Manager of Detroit Rex Products Company, manufacturers of Detrex solvent degreasers and metal washing equipment, recently announced the establishment of two new offices. The North Central Region, which includes the entire state of Michigan except the upper peninsula, has headquarters in Detroit. R. W. Pflug, who is in charge, also supervises the handling of large national accounts whose home offices, including purchasing and control, are in Detroit.

W. F. Newberry is manager of the South Central Region which comprises the states of Ohio, Indiana and Kentucky. Offices for this territory were recently established in the Mutual Home Building, Dayton, Ohio.

Quick Facts About Hotel Rates and Transportation 31st A. E. S. Convention

Hotel & Location	Room Capacity	Single Without Bath	Single With Bath	Double Without Bath	Double With Bath	Twin-Bedded
BUFFALO	450	....	$2.50 to	....	$4.00 to	$4.50 to
Washington & Swan			4.00		7.00	8.00
FORD	750	$1.50	2.00 to	$2.50	3.50 to	4.00 to
210 Delaware Ave.		1.75	2.50	2.75	5.00	5.00
GRAYSTONE	150	1.50 up	2.00 up	2.50 up	3.00 up	3.50 up
24 Johnson Park						
LAFAYETTE	420	2.25	2.75 up	....	4.50 up	5.50 up
Wash. & Clinton						
LENOX	250	....	3.00	....	4.50	5.00
140 North St.			3.50		5.50	6.00
STATLER	1100	....	3.30 up	....	5.50 up	6.60 up
Niagara Square						
TOURAINE	300	....	2.25 up	....	3.85 up	5.00 up
274 Delaware Ave.						
STUYVESANT	450	....	2.50 to	....	4.00 to	6.00 up
245 Elmwood Ave.			5.00		12.50	
WESTBROOK	312	....	4.00 up	....	6.00 up	6.00 up
675 Delaware Ave.						

The Ford, Graystone, Lafayette, Buffalo and Touraine hotels are all within walking distance of the Statler.

GREYHOUND BUS FARES FROM BUFFALO, N. Y.

	One-Way	Round Trip
New York, N. Y.	$6.10	$11.00
Cleveland, Ohio	2.91	5.21
Boston, Mass.	7.15	12.90
Chicago, Ill.	8.20	14.80
Detroit, Mich.	5.10	8.25

Erie, Pa.	1.55	2.80
Syracuse, N. Y.	1.95	3.55
Rochester, N. Y.	1.00	1.80
Binghamton, N. Y.	3.00	5.40

All fares quoted subject to 10% Government Tax

AIR LINES FARE FROM BUFFALO, N. Y.

	One-Way	Round Trip		One-Way	Round Trip
Washington, D. C.	20.70	46.40	Milwaukee, Wis.	29.00	58.00
Syracuse, N. Y.	7.49	14.98	Montreal, Que.	24.95	49.50
Boston, Mass.	24.42	48.82	New York, N. Y.	17.95	35.90
Chicago, Ill.	27.00	54.00	Philadelphia, Pa.	22.75	45.50
Cincinnati, Ohio	24.80	49.60	Pittsburgh, Pa.	12.75	25.50
Cleveland, Ohio	10.75	21.50	Rochester, N. Y.	3.24	6.48
Dayton, Ohio	22.04	44.08	San Francisco, Cal.	132.00	264.00
Detroit, Mich.	13.25	26.50	St. Louis, Mo.	38.95	77.90
Grand Rapids, Mich.	21.85	43.70	Toledo, Ohio	16.90	33.80
Hartford, Conn.	19.23	38.46	Toronto, Ont.	4.60	9.20
Indianapolis, Ind.	28.29	56.58	Los Angeles, Cal.	132.00	264.00

All fares quoted subject to 10% Government Tax

RAILROAD FARES TO BUFFALO

	One-Way Pullman	Round Trip Pullman		One-Way Pullman	Round Trip Pullman
Anderson, Ind.	14.30	27.40	Milwaukee, Wisc.	20.19	37.10
Washington, D. C.	14.36	27.50	Montreal, Que.	14.40	25.90
Syracuse, N. Y.	4.90	9.75	Newark, N. J.	12.93	24.90
Boston, Mass.	16.39	31.20	New Haven, Conn.	15.24	29.43
Bridgeport, Conn.	15.79	30.53	New York, N. Y.	13.09	25.15
Chicago, Ill.	17.38	32.85	Philadelphia, Pa.	13.75	26.35
Cincinnati, Ohio	14.47	27.75	Pittsburgh, Pa.	8.53	16.65
Cleveland, Ohio	6.11	12.05	Providence, R. I.	16.34	31.21
Dayton, Ohio	12.98	25.00	Rochester, N. Y.	2.20	4.40
Detroit, Mich.	8.53	15.40	San Francisco, Cal.	90.57	129.60
Grand Rapids, Mich.	12.80	24.10	Springfield, Mass.	13.15	25.25
Hartford, Conn.	14.03	27.01	St. Louis, Mo.	23.71	43.80
Indianapolis, Ind.	15.51	29.50	Toledo, Ohio	9.63	18.80
Lancaster, Pa.	11.50	22.30	Toronto, Ont.	3.78	6.85
Los Angeles, Cal.	90.57	129.60	Waterbury, Conn.	16.01	34.51

All fares quoted subject to 10% Government Tax

DETROIT PROPOSES AMENDMENT

The Detroit Branch wishes to propose an Amendment to the By-Laws to clear up the present Section on Awards, as follows:

Proposed Amendment: Section 10 of Article IV of Part I of the By-Laws shall read as follows:

> Committee on Papers' Awards. The President shall appoint before each convention the Chairman and members of the Committee on Papers' Awards who shall be active or associate members of the Branches. This Committee shall be governed by permanent rules on Paper Awards which are to be appended to these By-Laws. Any change or departure from these rules shall be effected by application of the Committee Chairman for approval by the Executive Board. Any change in the awards to be made shall, on approval of the Executive Board, become automatically a part of the permanent rules. The Committee shall make selections for such awards and announce their decisions during the Annual Convention or as soon thereafter as practicable.

This is for the consideration of your Branch, so that your delegates to the National Convention may be properly instructed.

WRIGHT W. WILSON, *Acting Secretary-Treasurer*

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This special Wyandotte solvent cleaner is giving exceptional results in cleaning prior to Parco-Lubrizing. If this important processing operation is in your production line write us for full particulars.

Wyandotte M.K.3W requires no special equipment. It is a safe and economical liquid cleaning compound to use.

There is a specialized Wyandotte Cleaner for every war production metal cleaning job.

Wyandotte Service men will be glad to consult with you on any cleaning problem.

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J. B. Ford Division, Wyandotte, Michigan

★ *Wyandotte Chemicals Corporation consolidates the resources and facilities of Michigan Alkali Company and the J. B. Ford Company to better serve the nation's war and post-war needs.*

PRE-VIEW

of plating development

- DURING WAR
- AFTER WAR

American Electroplaters' Society

31ST ANNUAL CONVENTION

BUFFALO, NEW YORK

HOTEL STATLER

June 7,8,9—1943

6 Educational Sessions — 26 Vital Technical Papers — all by outstanding authorities: A few highspots:

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Electroplating and Govt. Restrictions—W. W. McCord, W.P.B.

Military Applications — Wm. Blum, Bureau of Standards

Effects of Various Annions in Metal Cleaners—E. C. Rinker, Oakite

Modern Degreasers—F. Dammers, Blakeslee

Blackening of Ferrous and Non-Ferrous Metals — Walter Meyer, Enthone

Industrial Salvage by Electrodeposition—O.G.Hogaboom, New Britain Machine

Cronak Process—E. A. Anderson, New Jersey Zinc

Electroplating's Future—E. W. Cochran, National Cash Register

Infra-Red in War-Time—W. S. Crandall, Fostoria Pressed Steel

Plating Cutting Tools — A. F. Fletcher, Brewer-Titchener

Racking in Hard Chrome Plating—A. W. Logozzo, Hartford Chrome

Burring—H. L. Kellner, Lea

Controlling Solutions with Hull Cell—F. MacIntyre, Du Pont

For Fast, Economical, Grinding, Polishing, Or Sharpening —Get the LASALCO CUSHIONED BELT GRINDER

Here's a real all-purpose grinding and polishing machine that will grind and polish iron, brass, aluminum, bakelite, horn, and many other materials. It can be used to sharpen drills, knives, or any edged tool.

An abrasive faced belt runs over a rubber surfaced ball bearing pulley and the work is polished on this pulley. There are no wheels to buy, to set up, or turn down. The belts are low in cost and easily changed in a few seconds.

Don't waste time with files and sandpaper — and don't hold up expensive production machines — get a Lasalco Cushioned Belt Grinder. It's supplied with a stand or for bench mounting.

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ENTHONE RELEASES NEW LITERATURE

BLACKENING PROCESSES FOR METALS

An eight page illustrated folder in color, describing the "Ebonol" processes for blackening iron and steel, zinc and zinc alloys, copper and copper alloys, and aluminum and aluminum alloys. Characteristics of the coatings obtained, and general information on the processes, are given.

BLACKENING OF ALUMINUM AND ITS ALLOYS

A four page folder issued by The Enthone Company, New Haven, Conn., describing the company's Ebonol "A" process for blackening aluminum and its alloys. Characteristics of the coating, as well as specific operating details, are given.

BLACKENING OF ZINC AND ZINC ALLOYS

A four page folder issued by The Enthone Company, New Haven, Conn., describing the company's Ebonol "Z" process for blackening zinc and zinc alloys. Characteristics of the coating, as well as specific operating details, are given.

BLACKENING OF COPPER AND COPPER ALLOYS

A four page folder issued by The Enthone Company, New Haven, Conn., describing the company's' Ebonol "C" process for blackening copper and copper alloys. Characteristics of the coating, as well as specific operating details, are given.

WILLIAM C. DAKE DIES

Mr. W. C. Dake, a member of the Grand Rapids Branch, passed away early in February at Lake Worth, Florida.

Mr. Dake was general superintendent of the American Brass Novelty Co. at Grand Haven, Michigan. Mr. Dake's father, the late Wm. F. Dake, invented the Dake Engine and founded the firm bearing his name.

Mr. Dake was widely known throughout the state for his fraternal associations and industrial leadership.

BUCKINGHAM COMPOUNDS

NOW USED IN

WAR PRODUCTION

BURRING • GREASELESS

HARDENED STEEL COMPOSITION

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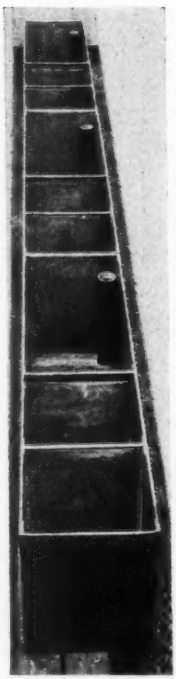
Line It with Lead

Lead continues to be the most readily available material for acid tank linings. It has always been one of the most popular and satisfactory materials for this service. For more than fifteen years Storts has operated a special department, manned by experts in shaping sheet lead to fit all manner of shapes, partitions, compartments and fittings; and by weldmen who have outstanding skill in fusing this metal into perfectly sound cross sections.



Only lead work is done in this department, which is furnished with the best facilities and equipment for this work that can be found anywhere.

We also furnish solid lead tanks, coils, anodes and all varieties of fittings and assemblies of lead.

STORTS WELDING COMPANY

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Manufacturers of Welded Fabrications to Specification

BRANCH NEWS

Business and Social News • Educational Activities

GRAND RAPIDS BRANCH

Below are the minutes of the last Grand Rapids Branch meeting for publication in the *Review*.

The regular meeting of the Grand Rapids Branch was held April 9th at the Browning Hotel and was promptly started at eight o'clock by first showing of a new talking movie recently released, entitled "World at War." This movie film gave a pictorial record of the present War to date. All scenes were authentic, parts of the pictures having been taken from films captured from the Germans and Japs.

The meeting again proved to be an interesting one and was attended by a large number of members and friends.

The nominating committee's selection of officers was unanimously adopted and the following new officers for the coming year were elected:

President, Homer G. Morton; First Vice President, Maurice R. Caldwell; Second Vice President, Stewart Z. Martin; Secretary-Treasurer, C. E. Abel; Librarian, Ivan C. Hepfer. Board of Managers: Maurice R. Cauldwell, James B. Haviland, Jack J. Hanney.

The election represents a continuance in office of the same officers for the coming new year, each having selected his assistants to help them in anticipated extension of work.

Eleven applications for admission to membership were presented and the following were voted upon and elected.

Martin A. Felix, Winters & Crampton Corp., Grandville, Mich.; F. G. Cyrex, J. C. Miller Co., Grand Rapids, Mich.; William Thomas Darling, Winters & Crampton Corp., Grandville, Mich.; Richard Jager, Winters & Crampton Corp., Grandville Mich.; Nicholas H. Lanning, Keeler Brass Co., Grand Rapids, Mich.; Sidney G. Lammers, self employed, Grand Rapids, Mich.; Alfred Gordon Lee, Continental Aviation and

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If your plating or metal finishing is unsatisfactory, its almost certain the surfaces have not been properly cleaned.

In that case PERMAG is the perfect answer to your problem.

More electroplaters are depending on PERMAG Cleaning Compounds than ever before.

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In Canada:

Canadian Permag Products, Ltd., Montreal, Toronto

Engineering Corp., Muskegon, Mich.; Jack Lehmoine, Keeler Brass Co., Grand Rapids, Mich.; Peter C. Mendels, Winters & Crampton Corp., Grandville, Mich.; Robert C. Meech, Winters & Crampton Corp., Grandville, Mich.; Ransom B. Perkins, W. B. Jarvis Co., Grand Rapids, Mich.

Delegates were then elected for the coming Convention to be held in Buffalo, June 7th, 8th and 9th.

Delegates: Stewart Z. Martin, Ivan C. Hepfer, William J. Van Dyke. Alternates: R. C. Binder, R. I. Slater, Jack J. Hanney.

The yearly financial report was given and recorded.

Communications were then read, discussed, voted upon and approved.

There being no further business, Mr. R. H. Dudley of the United Chromium was introduced. Mr. Dudley's paper covered Hard Chromium Plating and various applications of the Hard Chrome plating was outlined as well as details of the technique used and recent developments by United Chromium. After the paper was given an open question forum was conducted and many problems solved through the question and answer medium.

The meeting was then adjourned and the popular twenty-five cent lunch was served by the Hotel, and to further aid the coffee shortage, Pabst Blue Ribbon Beer was on the menu again.

C. E. ABEL, *Secy.-Treas.*

MILWAUKEE BRANCH

The 338th regular meeting of the Milwaukee Branch was held March 5, 1943, in the Republican Hotel. Mr. Robert Steuernagel, Jr., presided in the absence of Mr. Rodney Olsen. The minutes of the previous meeting were read and corrected. The minutes after reading with corrections were approved.

Communications were read and placed on file. The Branch suggested that the secretary write the Buffalo Branch and explain the lack of displayable material and pictures because of the secrecy needed about parts in war plants at this time.

Librarian William Geissman introduced Mr. Pagnougel and Mr. Ausman of the West Allis Vocational School, who proceeded to show how job instucting should be done. Their methods were interesting and informative and I'm sure that everyone present considered the evening very well spent. The speakers were given a rising vote of thanks and the meeting adjourned. Refreshments were then served.

April 2nd found the Milwaukee Branch electing its new officers for the year 1943-44. Mr. Robert Steurnagel, Jr., was elected President; Mr. Everett Robinson, First Vice President; Mr. Robert Goodsell, Second Vice President; Mr. William Geissman, Librarian; Mr. James Durnford, Secretary-Treasurer; and Mr. Henry Binder was elected to the Board of Managers for a three year term.

Mr. T. D. Hartshorn and Mr. Paul Kluber were elected active members.

The speaker of the evening was Mr. B. Case, service engineer for Hanson, Van Winkle, Munning Company, who talked about "Trouble Shooting in the Plating Industry." He told of some unusual cadmium solutions that wouldn't

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respond because of unknown contaminations and many others that were real challenges to the platers. His experiences proved very interesting and he was given a hearty round of applause.

The Milwaukee Branch wishes to express sincere regret at the passing of Mr. Paul Krause who had been an active member of the Milwaukee Branch since 1919.

JAMES DURNFORD, *Secretary*

BRIDGEPORT BRANCH

The regular monthly meeting of the Bridgeport Branch of the American Electroplaters' Society was held April 2, 1943 at 8:00 P.M. at the Chamber of Commerce Rooms, Stratfield Hotel. President Charles McElroy opened the meeting with 24 members present. Also present were our good friends Jack English and John Buckman of the New Haven Branch and Derick Hartshorn of the Springfield, Mass., Branch.

The roll call of officers was read and B. F. Kusterer, and R. J. O'Connor were reported absent. The minutes of the previous meeting was read and accepted.

C. C. Helmle, J. G. Sterling, Chas. McElroy and Hubert Goldman gave reports of meetings and progress made regarding the Regional Meeting to be held Saturday, May 1, 1943 at the Hotel Bond, Hartford, Conn. A very good Educational Session and Entertainment was assured to all who will attend this fine meeting.

The Amendment Committee of the Bridgeport Branch have completed this work and letters pertaining to an amendment in the constitution have been mailed to all the Branches of the American Electroplaters' Society. This amendment will be taken into consideration at the National Convention to be held in June, 1943 at Buffalo, N. Y.

The Exhibit Committee in charge of 1st Vice-President A. R. McNeil with the assistance of C. C. Helmle report good progress being made on a variety of displays to be made up by the Bridgeport Branch. These shall be presented at the National Convention in June, 1943 at Buffalo, N. Y.

F. B. Gotthardt, chairman of the Sick Committee reports every one to his knowledge doing fine. Wm. Flaherty attended our meeting after being sick and convalescing and looks very good. Glad to see you attend our meetings again "Bill" because you always did attend our meetings and sessions with cheerfulness and a fine attitude.

Membership Committee reports progress being made.

Technical Session Committee reports a good round table discussion on various problems of the Plating Industry.

The following men were elected to serve as officers of the Branch for the coming year:

President, Arthur R. McNeil; 1st Vice President, Herman Braun; 2nd Vice-President, Hubert M. Goldman; Secy.-Treasurer, Joseph G. Sterling; Librarian, John E. Charleson; Sergeant-at-Arms, Lawrence Griffin; Board of Managers, B. F. Kuster, Wilbur Stratton, William Thompson.

Delegates elected to the National Convention, to be held in Buffalo, N. Y., in June, 1943, are as follows:

Delegates: Clarence C. Helmle, Joseph G. Sterling, John E. Charleson. Alternates: Arthur R. McNeil, Raymond J. O'Connor, Stairn Pochna.

A letter from J. H. Donahue, secretary of the Regional Meeting advising of progress being made and that a final meeting of the Committee would be held in Hartford April 10, 1943, at the Hotel Bond at 2:00 P.M.

Change of name of society: An amendment sponsored by the Bridgeport Branch was submitted to all the Branches and the National Convention to be held in June, 1943 at Buffalo, N. Y.

Samuel Johnson, associate member sends in his resignation giving reason as no longer connected with the plating business. Resignation accepted by the Branch.

Bills against the Branch were ordered to be paid.

A motion was made and passed to have protective insurance for our projector machine. The secretary was ordered to apply for this insurance.

A motion was made and passed to start the business meetings promptly at 8:00 P.M. and concluded by 8:30 P.M. to give more time to sessions and round

table discussions which the Bridgeport Branch greatly enjoy.

The treasurer's report was read and accepted.

A motion was made and passed to arrange an informal assembly of our members in the Pine Room of the Stratfield Hotel to honor the new officers installed after the meeting. Refreshments were ordered and everyone present wished the new officers and members good will and success for the new fiscal year. The expenses were paid from the treasury of the Branch.

The meeting and assembly adjourned at 11:45 P.M.

JOSEPH G. STERLING, *Secy.-Treas.*

BUFFALO BRANCH

The regular April meeting was held in rooms 408-410 of the Hotel Statler, Friday, April 9 at 8 P. M. Our President, Joe Ruff called the meeting to order and welcomed the members of the Ladies' Convention Committee. He then introduced Mr. Crane, Vice President of the Lea Manufacturing Company who presented motion pictures taken at the 30th Annual Convention in Grand Rapids. (The projector and operator were supplied through the courtesy of the Keystone Chromium Company.)

After the showing of the pictures, the ladies retired to the adjoining room to work out the details of the Ladies Program. We were then given an interesting and informative talk on "Burning" by Mr. Crane. This paper is printed in its entirety (except for a couple of good stories) in the April issue of the Review. The importance of burring was illustrated by a case in which the power of a certain model of Pratt & Whitney Aircraft engine was increased 10% merely by burring all moving parts of the engine. Mr. Crane was nearly swamped with questions but he was far from stumped. He was given a rising vote of thanks by all members present for his excellent presentation of such a timely subject.

Joe Ruff then took the chair for our regular business. The treasurer's report and the minutes of the previous meeting were read and approved.

Don Rice read the report of the nominating committee along with the suggestion that the retiring president automatically become Chairman of the Board of Managers. This suggestion was made into a motion by Bill Fotheringham, seconded by Bill Hart and carried. There being no new nominations for president, Mr. Logan was unanimously elected. At this point Mr. Monneypenny expressed the opinion that the nominating committee had shown excellent judgment and moved that the entire list of nominees be elected. This was seconded by Mr. Day and carried without a dissenting ballot.

Attention was called to the presence of two new members; Walter Wollage and Ed Kopinski, as well as a visitor from Rochester, Mr. Dougherty. All were given a hearty welcome by the members.

The time and place of our next meeting of the committee were agreed upon as 3:00 P. M. Sunday, April 18th at the home of Bill Hart.

The meeting was then adjourned at 11:30 P. M.

J. C. MAYS, *Secretary*

ROCHESTER BRANCH

The regular monthly meeting of the Rochester Branch was held Friday, April 16, 1943 at the Hotel Seneca.

The meeting was called to order at 8:00 by President John Q. Adams.

The minutes of the previous meeting were read and approved and the financial report was read.

Under new business it was voted to purchase a $100 War Bond for the Rochester Branch, during the Second War Loan Drive. Communications were read and acted upon and delegates to the National Convention were elected.

Mr. Lo Presti introduced Mr. Derrickhartshorn of the Enthone Co., speaker for the evening. Mr. Derrickhartshorn gave an interesting talk on the blackening of steel. He gave a very vivid description on the advantages and disadvantages of the various types of blackening processes. Various members had questions to ask and Mr. Derrickhartshorn answered in great detail. The very interesting lecture was enjoyed by all present, and the members gave Mr.

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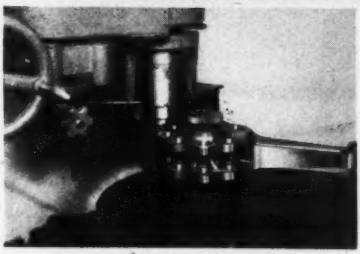

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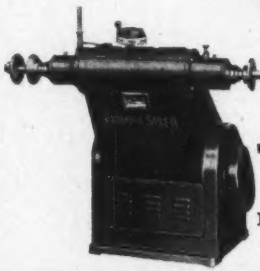

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Derrickhartshorn a rising vote of thanks.

The meeting was adjourned at 10:30.

DONALD C. BLUM, *Secretary*

INDIANAPOLIS BRANCH

The meeting was called to order by the president who asked for the minutes of the previous meeting. These minutes were read and approved.

Mr. Walter Binai introduced the speaker of the evening as a cracker-jack speaker, Mr. Myron B. Diggin, Chief Chemist and Research Engineer of the Hanson-Van Winkle-Munning Company. Mr. Diggin made a 700-mile trip to talk to us Hoosier Platers. Mr. Diggin's subject was on "Recent Developments in Zinc Plating," a subject which he presented at the Twenty-first Annual Educational Session of the American Electroplaters Society, Chicago Branch, on January 23, 1943.

Mr. Diggin pointed out that ten years ago there was not much for a manufacturer who wished to protect ferrous articles against corrosion with zinc. He could choose hot galvanizing for many bulky articles but it was found that hot galvanizing was either too expensive or lacked eye appeal.

When the manufacturer turned to electro deposited coatings, the choice lay between acid zinc and cyanide zinc deposits. Acid zinc solutions produced frosty white deposits which often had relatively low protective value. The throwing power of acid solutions was amazingly poor. Furthermore, the PH of acid solutions was unstable.

Cyanide Zinc solutions as they were used ten years ago, ranged from dull-gray to dull-white and the results were disappointing compared to bright cadmium which produced coatings that were pleasingly lustrous and which had less tendency to stain or tarnish and was less difficult to control.

When the price of cadmium skyrocketed a few years ago Mr. Diggins predicted that excellent results could be secured with bright zinc processes and if handled properly, zinc coatings would expand and cadmium would slow up because of the higher price over zinc. Bright zinc solutions are capable of being operated at current densities of 60

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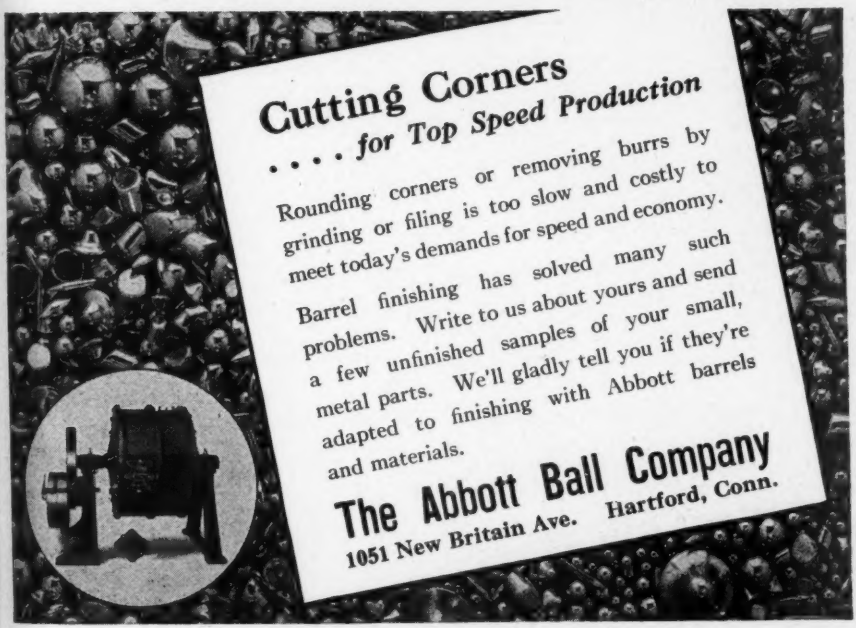
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amps./sq. ft. without agitation and coatings, well within the bright range can be secured with 45 amps./sq. ft. and irregular shaped and protruding articles can be plated without danger of "burning" the exposed portions.

A good formula for a semi-bright zinc solution is:

Zinc cyanide	8	oz./gal.
Sodium cyanide	5	oz./gal.
Sodium hydroxide	12	oz./gal.
Zinc addition agt. S-B	0.8	oz./gal.

The zinc addition agent is composed of a balanced mixture of sodium fluoride, gum Arabic, cystine and other amino acid derivatives.

In unagitated solutions the cathode current density range is 10-40 amps./sq. ft. Maximum brightness is obtained if the solution temperature range is maintained at 70-75°F. Within this temperature range, the cathode current efficiency at 30 amps./sq. ft. is 86%. The deposits are somewhat lustrous as they are taken from the plating bath. A momentary dip in a ½% nitric acid solution increases the brightness and gives the deposit a lighter tone.

There are so many fine points and excellent suggestions in Mr. Diggins paper that I could go on for an hour with this report, but since time is short I will close with this suggestion, "If any of you are interested in zinc plating I would suggest you try to secure a copy of Mr. Diggins' paper which was presented at the January 23, 1943, Twenty-first Annual Educational Session of the Chicago A. E. S. I think you will find it to be one of the finest papers ever written on this subject.

After a vote of thanks to our speaker, the meeting was adjourned by the president.

Respectfully submitted,

W. W. COTHRAN, *Secretary-Treasurer.*

BALTIMORE-WASHINGTON BRANCH

The Baltimore-Washington Branch of the A.E.S. held its meeting at the Telford's Buffeteria on April 3, 1943, with President Warnock in the chair. Twenty-seven members and guests were present. One new membership application was turned in and four candidates were elected into membership. On the other side of the ledger, about 10 members are on the verge of being dropped for nonpayment of dues.

Mr. L. H. Turner, who had been ill for some time, was present at this meeting, and was welcomed back by the members.

Dr. V. A. Lamb, librarian, introduced the speaker, Mr. L. G. Tubbs, who is chief chemist of the Mutual Chemical Company. He spoke on "Dyed Anodic Coatings on Aluminum." The general impression that anodic films produced on aluminum from a chromic acid bath cannot be dyed, is mistaken. The intensity of color obtained is proportional to the film thickness, which is affected by pH and temperature. In the anodizing process, the voltage of 50 v. seems to be a critical point, as the films produced above and below 50 v. have somewhat different shades after dyeing. The concentration of the dye bath, whether 1 or 5 g. of dye per liter has little effect on the shade. The colors are not all fast to light and washing. One use of dyed films is for identifying electrical circuits on warships, and for distinguishing between different types of screws.

ABNER BRENNER, *Secy.-Treas.*

NEWARK BRANCH

The regular meeting of the Newark Branch, A.E.S., was held on Friday evening, March 19th, 1943, at the Hotel Robert Treat in Newark, N. J. The meeting was called to order at 8:45 P.M. with President William Bruhns presiding. Other officers present were Robert R. Sizelove, 1st Vice President; Louis Donroe, 2nd Vice President; George Wagner, Secy.-Treas.; William T. Maquire, Librarian; John DeVries, Sgt.-at-Arms; Horace H. Smith and Paul A. Oldam, Board of Managers.

The minutes of the previous meeting were read and approved.

A communication from Conmar Products Corporation was read and the members took note of its contents.

Application for Jerome C. Wade to Active Membership was voted to take the regular course.

Mr. William T. Maguire reported progress on the Special Educational Session scheduled for May 1, 1943.

Mr. Robert R. Sizelove, who was present for the first time since his accident in January, reported on the condition of

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Mr. John Kotches, stating that he was improving steadily and that John expected to attend our next meeting.

The Guest Speaker for the evening was Mr. Myron B. Diggin who is one of our own members and he was presented by our Librarian.

Myron's subject was "Zinc Plating versus Cadmium Plating." He brought out the fact that Zinc Coatings were rapidly replacing Cadmium Coatings especially on steel parts for the war effort where a protective value is the main factor. He also brought out the fact that Zinc Coatings with subsequent treatments of Cromac or some other surface treatment would withstand corrosion tests longer than Cadmium in deposits of equal thickness.

Myron was bombarded with numerous questions after his talk which he answered very satisfactorily. He was given a rising vote of thanks by the 44 members who attended.

The meeting adjourned at 11:00 P.M.

GEORGE WAGNER, *Secretary*

HARTFORD BRANCH

The March meeting of the Hartford chapter was held Monday, March 15, 1943, at 8 P.M. at the New Britain Trade School, New Britain, Conn. The following men were elected to membership:

Harold Bishko, Earle B. Lewis, Harold J. Dooley, as associated members. Anthony Frascarella, as an active member.

The applications of Lucien A. Andrews and Burton S. Hubbell were accepted for active membership.

Further reference is made to our Regional Convention on May 1st and information about the progress of preparations was presented. We had two speakers who presented very interesting papers which culminated in a lively discussion at the end of the meeting.

Mr. Ralph Colter of the Waterbury chapter served as our technical chairman of the evening, and introduced Wes Cassell, Equipment Sales Manager for MacDermid of Waterbury, Conn. Mr. Cassell pointed out that priorities can be obtained for equipment when the proper need is shown. He also stressed the point that better equipment gave greatly increased production which was necessary under the present war program. His remarks were an elaboration on the article he wrote for the January issue of the *Review*, and on washing machines, various types of barrel plating machines, etc., full-automatic plating machines, etc., which were discussed at considerable length.

He also took up the subject of drying equipment, filters and rectifiers.

Mr. Henry Strow, Research Engineer with MacDermid, Inc., Waterbury, Conn., followed Mr. Cassell. His talk was an elaboration of his article in the December *Review*, the History of Alkali Cleaners up to the present time, was presented with various present-day developments, such as the Tainter Process, the use of Gluconic Acid in washing milk cans, Amyl Phosphoric Acid in the preparation of aluminum for spot welding, alkali and chromic acid in the stripping of steel cases.

Many new faces were present, which we feel to be a healthy sign under the stress of modern transportation. The speakers were given a rising vote of thanks.

K. P. BELLINGER, *Secretary*

GRAND RAPIDS BRANCH

The regular meeting of the Grand Rapids Branch was held March 12th at the Browning Hotel. The meeting was well attended by approximately 100 members and friends.

Sound moving pictures describing the Royal Air Force in bombing action over the enemy territory was shown promptly at eight o'clock. This picture and instructive talk was highly entertaining.

A short business session was then conducted by our President, Mr. Homer Morton, and two applications for membership were presented: Mr. Sidney G. Lammers of the Winters & Crampton Company, Grandville, Michigan, and Alfred Gordon Lee of the Continental Aviation Engineering Corp., of Muskegon, Michigan, whose membership acceptance will be voted upon at our April meeting.

Communications regarding the Convention to be held at Buffalo next June were read and definitely announced that the Convention would be held. One other communication was read and discussed —a proposal to amend the By-Laws to clear up the present section on awards.

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There being no further business, our Librarian then introduced our well-known member, Chester W. Smith of the Detroit Rex Products and his assistant for the evening, Mr. D. E. Willard of the same company.

The subject was "Metal Cleaning for All Industries," and Mr. Smith showed how the various cleaning methods can be used to best advantage in the preparation of metals for plated and organic coatings. He also demonstrated the effectiveness of alkali cleaning, spirits and emulsion cleaning and solvent degreasing. Applications describing the cleaning problems were applied to specific work and special flow diagram slides were used to summarize and to show where cleaning is required in different industries.

We can well recommend this team of cleaning experts to any of the Branches. Their demonstrations and technical data were well presented.

A partial open forum of the meeting was then conducted and there being no further business, the meeting was adjourned and refreshments served by the Hotel.

C. E. ABEL, *Secy.-Treas.*

NEWARK BRANCH

The regular meeting of the Newark Branch A.E.S. was held on Friday evening, March 5, 1943 at the Hotel Robert Treat in Newark, N. J. The meeting was called to order at 8:30 P.M. with President William Bruhns presiding. Other officers present were: George Wagner, Secretary-Treasurer; William T. Maguire, Librarian; John DeVries, Sgt.-at-Arms; and Horace H. Smith and Paul A. Oldam, Board of Managers.

The minutes of the previous meeting were read and approved.

A communication from the Detroit Branch with reference to an amendment to the Constitution was read and it was decided to leave the amendment to the discretion of the delegates to the Convention.

A communication from the Buffalo Branch with reference to an exhibit was read and the President appointed Mr. Paul Oldam as Chairman of a Committee for Exhibits, giving him full power to appoint members of his own choosing to make up the rest of the Committee.

A communication from the Colonial Alloys Company was read and the members took note of its contents.

Applications for Mr. William H. Hayford, Jr., and Victor George Michaels to Associate Membership were voted to take the regular course.

Mr. William T. Maguire and Mr. Horace Smith reported on the contemplated Special Educational Session to be held May 1, 1943 at the Hotel Robert Treat. The Educational Session, although as yet not very definite, will consist of an outstanding authority on Zinc Plating and Moving Picture Films of a very educational value by the Aluminum Corporation of America. This will be followed by refreshments for which there will be no charge, nor will there be any admission charge to the Educational Session.

It was voted that Newark Branch purchase a $1,000 War Bond and donate $20.00 to the American Red Cross.

The Guest Speaker for the evening was Mr. John C. Bogle of the Udylite Corporation who was presented by our Librarian, William T. Maguire. Mr. Bogle travelled all the way from Detroit, Michigan, to give us a talk on "Rectifiers" or "Rectoplaters" in the Plating Industry. If any of the members present didn't know anything about rectifiers they certainly learned a lot from Mr. Bogle's talk which was both educational and amusing. After he invited all the members to join him and his associates to their room for some refreshments he was given a rising vote of thanks by the 61 members who attended.

The meeting adjourned at 11:00 P.M.

GEORGE WAGNER, *Secretary*

BOSTON BRANCH

Boston Branch met Thursday, April 1st, at the Statler Hotel, Boston, with President Swift in the chair.

Minutes of the previous meeting read and approved.

Communication read from Bridgeport Branch suggesting a change in the by-laws of the A.E.S., after much discussion the Branch voted to instruct its delegates to vote against it as they think the A.E.S. should remain as a platers' society.

The committee reports that all plans for the banquet are completed and a real

Boston time is on the bill, come and meet all your friends.

With the regular business out of the way George Swift acted as Librarian until Lou Gagnon arrived. The speakers were Wesley Cassell, and Dr. George Morris of the Massachusetts Department of Public Health.

Wesley Cassell spoke on "Equipment in the Plating Industry," he covered about everything in the plating line from cleaning, plating cycles, barrel plating, anodizing, motor generators, and rectifiers; he also showed pictures of this equipment. His talk was very good and a rising vote of thanks was in order, thanks, Wes.

Dr. George Morris was the next speaker. His talk was new to Boston Branch. Subject, "Industrial Dermatitis." He spoke of how you will take care of your shoes and if you do this, you must take care of your hands. Explaining the different things that happen in plating rooms where conditions are bad, poor blower systems, men not using gloves, aprons and rubber boots, stating that if these things were taken care of the rashes on the hands and body would not happen. He answered all questions and was given a rising vote of thanks for one of the best talks heard by this Branch in a long time.

Meeting adjourned at 11 P.M.

A. W. GARRETT, *Secy.-Treas.*

BUFFALO BRANCH

The regular March meeting was held Friday the 12th in Parlor C of the Hotel Statler. Several members of the Convention came early and met with Mr. Barlow of the Hotel and were shown the facilities of the 17th floor where our Convention Sessions are to be held. It is hard to visualize a better setting for these meetings.

On our return to Parlor C, our Vice President, Charlie Logan took the chair and called the meeting to order at 8:00 p.m. The minutes of the February meeting were read and approved. Our Secretary read the financial report on the Fall Educational Session. This report was unanimously accepted. The Treasurer's report was then read and approved.

The members were introduced to Mr. Mau of the Keystone Chrome Corporation who had just been accepted for

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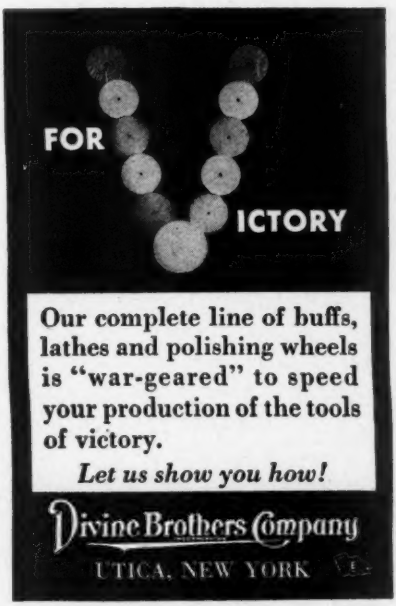
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membership. The meeting was then turned over to Dr. Wernlund who conducted a discussion on the "Plating of Cast Iron."

Resumé

Cadmium gives an excellent coating on Cast Iron but at present, war restrictions prevent its wide use and it is being replaced by Zinc. The Sulphate bath gives a good coating on relatively even surfaces but the throwing power is poor. For surfaces with recesses that must be plated the Cyanide solution is preferable. Good coatings can be obtained with this bath if the casing is machined or sand blasted and then cleaned cathodically in Sodium Cyanide solution before plating. A preliminary coating of Iron or Nickel will also be suitable preparation for Zinc Cyanide plating.

One of the main troubles with Brass or Copper plating on Cast Iron is "Spotting Out." This can be prevented by drying at 300°F. after plating and then coating with Clear Lacquer.

Practical methods of solving plating problems were demonstrated by Bill Hart, assisted by Joe Fusco, night foreman at Colonial Radio. One problem was the Cadmium plating of small tension springs. This was accomplished by the use of a holder which stretched the springs and allowed the solution and current to reach the entire area of the wire. The other problem involved the use of fine wire and a sliding contact to prevent shading during the Silver plating of short wave radio coils. The members gave evidence of their keen interest by asking numerous questions which were ably answered.

The meeting was adjourned at 10:30 p.m. followed by a short meeting of the Convention Committees to clear up a few points and inform the members of the coming meeting on Sunday afternoon.

Pre-Convention Broadcast

Sunday, June 6, 1943 2:00-2:30 p.m.

Rochester Electroplaters Buffalo
WHEC WBEN

"The Quiz of Two Cities"

All delegates invited to the WBEN studios in Hotel Stater, Convention Headquarters, to see and hear the Buffalo end of this battle of wits.

J. P. MAYS, *Secretary*

WATERBURY BRANCH

Waterbury Branch held its regular monthly meeting Friday, March 12 in the Colonial Room at the Hotel Elton. Twenty-one members and guests were present at the 6:30 P. M. dinner and forty five when the meeting opened at 8:00 P. M. We were pleased to note a large delegation from the Hartford Branch.

President Ralph Colter asked for a vote to accept Clinton W. Davisson and Edward J. Garland as associate members of the Branch. Their applications having been approved by the board of managers, it was unanimously voted to accept them.

Wes Cassell discussed the Regional Meeting which is to be held in Hartford, May 1 at the Hotel Bond. The Educational Session will take the form of a metal finishing clinic led by Walter Meyer and Clarence Helmle. Questions on all types of finishing will be answered by a large group of well known experts. Dinner will be followed with a talk by Senator Danaher and then some real entertainment will be provided.

Technical Chairman Arthur Tracy first introduced Bill Starr who told us about some of the newer developments in Priorities. Then Ellsworth Candee spoke about the National Convention which will be held at Buffalo, June 7, 8, and 9. The O.P.A. has ruled that no convention shall be held unless it serves a useful purpose, therefore this convention will be strictly business as is evidenced by the very high quality of the papers already scheduled for the educational program.

Our movies were first, a film, "Lake Carrier" showing the role of the ore boats transporting iron ore on the Great Lakes, second "Russia Fights Back," showing very realistically the battle about Stalingrad and third "Marine Hymn" depicting the work of our Marines throughout the world.

After the movies Art introduced J. H Donahue of the Abbott Ball Company and Dr. H. L. Kellner of Lea Manufacturing Company. These gentlemen discussed various methods of burring, Donahue showing what can be done by use of a barrel and Kellner covering the hand methods of filing, abrasive belts, polishing wheels, and flexible wheels

using greaseless compounds. Samples illustrating various types of work were passed around. Both talks found attentive listeners and an extended question period resulted. A rising vote of thanks was given both speakers at the end of the meeting.

S. L. HENN, *Secretary*

DETROIT BRANCH

Our April meeting was held Friday evening, April 2nd at Hotel Statler with about ninety members and visitors present to hear Mr. Frank K. Savage, of C. G. Conn, Ltd. His explanation and colored movies on the reactions at the anode and cathode in various plating processes was well received. There were very few questions as Mr. Savage gave such a detailed explanatory and well-planned report on the anode, cathode phenomena that all the queries must have been anticipated beforehand.

The election of officers for the coming year are:

President, James E. Fritts; First Vice President, R. B. Saltonstall; Second Vice President, Wright W. Wilson; Secretary-Treasurer, Russell Axsom; Librarian, Joe Hoefer.

Board of Managers: Charles Beaubien, Walter Pinner, Edgar Hahn.

Delegates to National Convention: Walter Pinner, Wright W. Wilson, James E. Fritts.

Alternates: Paul Amundsen, Joe Pawlick, C. E. Heussner.

They will be installed at our May meeting.

Mr. Gustave Soderberg of the Udylite Corporation will be our speaker in May, and we welcome any visitors to these meetings.

W. W. WILSON, *Acting Secy.-Treas.*

SPRINGFIELD BRANCH

The regular monthly meeting of the Springfield Branch, American Electroplaters Society was held on February 22nd at the Hotel Charles. The meeting was called to order by President Prouty. The minutes of the previous meeting were read and approved.

Mr. Ulrey and Dr. Davis of the Ameri-

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can International College described a course in Electrochemistry which they are teaching at the College. The course will be sponsored by the United States Office of Education. The requirements as outlined by the instructors would decidedly limit the number of enrollees, but it was agreed to permit any applicant who was engaged in the plating industry to enter the class. The textbook for the course will be Thompson's Theoretical and Applied Electrochemistry.

The following applications for membership were read: Frank J. Swords, Holyoke, Mass., Edmund F. Weiss, Pittsfield, Mass., and Donald J. Coudest, Pittsfield, Mass.

The secretary reviewed the plans for the Annual New England Regional Convention to be held this year in Hartford. The Springfield Branch under Mr. Costigan will be in charge of the publicity.

Mr. Robert Green of the Alsop Engineering Co. then presented a very interesting talk on filtration and controlled agitation of plating solutions. Included in the talk was a description of the newly developed agitating equipment recently developed by the company.

Mr. Green's talk was thoroughly enjoyed by all present and he was given a rising vote of thanks.

The meeting adjourned at 10:30 P.M.

D. S. HARTSHORN, JR., *Secretary*

SPRINGFIELD BRANCH

The regular meeting of the Springfield Branch, A.E.S., was held on March 22nd at the Hotel Charles. The meeting was called to order by President Prouty. The minutes of the previous meeting were read and approved.

Messrs. I. D. Niles, J. E. Costigan, and W. Hanford were appointed to the nominating committee. They will present their slate at the April meeting.

The following applications were accepted for associate membership: Frank J. Swords, Holyoke, Mass., Edmund F. Weiss, Pittsfield, Mass., Donald J. Coudest, Pittsfield, Mass., and John M. Johnston, West Springfield, Mass.

The educational session was led by Mr. Prouty, and consisted of an open forum on zinc and chromium plating and metal treatments. The following members acted as chairmen of the respective panels: Messrs. Hastie, Hanford and Prouty. They aroused considerable interest and enthusiasm with their able answers and comments.

After the educational session refreshments were served in the room by our genial host, Colin Hastie.

The meeting adjourned at 11:00 P.M.

D. S. HARTSHORN, JR., *Secretary*

TOLEDO BRANCH

The regular monthly meeting of the Toledo branch of the A. E. S. was held in parlor 201 of the Hilcrest hotel in Toledo, on Thursday, April 1st.

A dinner given by the branch, was served in the room to all members and guests present, at 7:30 o'clock, which was enjoyed by all.

After dinner a short business session was held. Mr. Vannorsdall the President called the meeting to order at 9 o'clock for the purpose of electing officers for the new fiscal year starting May the 1st.

An amendment, sponsored by the Bridgeport Branch to include to the membership of the Society those occupied in the allied arts of Anodizing, Chemical and Organic finishing, was read and thoroughly discussed, and upon a motion by Mr. Di Salle, seconded by Mr. Weiker the amendment was rejected, and the delegates to the convention are to be instructed to vote against the proposed amendment.

The nominating committee composed of Messers. Paul Dressel, R. G. Phillips, and Joseph Di Salle, turned in the following names for election, for President, Walter Weiker; 1st Vice-President, Ward Hunlock; 2nd Vice-President, Vic. Miner; Secretary, G. Bergman; Treasurer, Ed. St. Arnaud; Librarian, Kemsley Allison. Board of Managers, John Stegeman, Walter Morrow, and Chas. Vannorsdall.

Mr. Walter Weiker declined the nomination for President and the name of Paul Dressel was nominated from the floor for the office of President, Mr. Walter Weiker, and Mr. James Gerity was nominated from the floor for board of managers.

Following are the names of the members duly elected to their respective office by the membership of the Toledo branch of the A. E. S. for the fiscal year starting May 1st, 1943.

President, Mr. Paul Dressel; 1st Vice-

President, Mr. Ward Hunlock; 2nd Vice-President, Mr. Victor Miner; Secretary, Mr. Gaston Bergeman; Treasurer, Mr. Edward St. Arnaud; Librarian, Mr. Kemsley Allison; Board of Managers, Messrs., Weiker, Gerity, and Vannorsdall.

It was decided to have the next meeting in the office of Vic. Miner, at which time the books will be audited, and committee chairman shall be appointed by the new President, and to conduct any further business to come before the meeting.

Meeting adjourned at 10 o'clock, after which time plating problems were discussed during a friendly game of cards.

G. P. H. BERGEMAN, *Secretary*

TOLEDO BRANCH

A regular meeting of the Toledo branch was held at the Hilcrest hotel, March 10, with 12 members and officers present. The meeting was called to order by the President, Mr. Vannorsdall at 9:00 o'clock.

There was about 15 minutes discussion on hard chrome.

Mr. Vannorsdall lead a very interesting informal discussion on anodizing of aluminum which lasted about one-half hour.

A motion by Mr. Morrow that the Toledo Branch have a chicken dinner at the Hilcrest hotel for all of its members, was seconded by Mr. Heigel and past. It was announced by the President that right after the dinner there would be a short business session, at which time there would be election of officers, and auditing of the books, etc.

After a one-half hour bull session at which time plating problems in general were discussed with all the members taking part, the meeting adjourned at 10:45 o'clock.

G. P. H. BERGEMAN, *Secretary*

BALTIMORE-WASHINGTON BRANCH

The March meeting of the Baltimore-Washington Branch was held on Saturday, March 6, at the Hopkins Apartment Dining Room in Baltimore, Md. This was the only Baltimore meeting of the season, and Mr. K. Huston who had charge of the arrangements deserves credit for bringing out a good attendance. The Washingtonians gave the meeting

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good support, as half of the members present were from Washington, D. C.

Four new membership applications were presented, and Mr. Frank L. Davey of the Egyptian Lacquer Co. was elected into membership. A report on the annual banquet was given, and Mrs. Mabel Barrows was given a vote of thanks for her help in making it a success.

On the matter of enlarging the scope of the A. E. S., the Branch voted that the name of the society should not be changed, but that the constitution should be changed to permit workers in other branches of metal finishing to take a more active part in the society. The amendment on Papers' Awards which is sponsored by the Detroit Branch was approved by the Branch.

On the program, Dr. H. L. Kellner of the Lea Manufacturing Company delivered an informal and interesting lecture on "The Application of Polishing and Burring to the War Program." A paper on this subject has appeared in the January *Review*. One is impressed with the ingenuity which has been exercised in adapting various mechanical means and various shapes of wheels to solving burring problems.

ABNER BRENNER, *Secretary*

LANCASTER BRANCH

The Lancaster Branch of the A. E. S. met Friday, March 12, at the Y.M.C.A., Harrisburg, Pa.

This was our first out of town meeting for the year and I am pleased to report there were 30 in attendance.

The Chairman announced the following nominating committee:

Chairman, Dave Fleming, York, Pa.; Chris Brubaker, Lancaster, Pa.; Charles Snyder, Harrisburg, Pa.

It was decided to hold our May meeting for the election of officers at the Redmen's Hall. It was thought advisable to secure a technical picture to complete the program.

Mr. Chris Brubaker, one of our members, generously offered to "foot the bill" for a party after the business meeting. The Chairman appointed the following committee to make arrangements for the May meeting:

C. Bowers, Chairman; H. L. Hovis, Chris Brubaker, Clay Brubaker, W. H. Fordney.

At the conclusion of the business, Mr. Kilheffer, our Librarian, introduced Mr. Rinker of the Oakite Products Co.

Mr. Rinker talked to us on the cleaning of aluminum and its alloys prior to anodizing and spot welding.

WILLIAM H. FORDNEY, *Secy.-Treas.*

BRIDGEPORT BRANCH

The regular monthly meeting of the Bridgeport Branch of the American Electroplater's Society was held March 6, 1943 at 8:00 P.M. at the Chamber of Commerce Rooms, Stratfield Hotel. President Charles McElroy opened the meeting with 26 members present.

The roll call of officers was read and R. J. O'Connor, 2nd Vice President was reported absent. The minutes of the previous meeting was read and accepted.

C. C. Helmle and J. G. Sterling gave reports of meetings and progress made regarding the Regional Meeting to be held Saturday, May 1, 1943 at the Hotel Bond, Hartford, Conn. The Bridgeport Branch was given the task of advertising and President Chas. McElroy appointed Hubert M. Goldman as Chairman of the Advertising Committee. A meeting of this committee is to be held Saturday, March 20, 1943 at the Hotel Bond, Hartford, Conn., at 2:30 P.M.

Technical Session Committee reports to entertain members with pictures on "Mining and Refining of Nickel" by the International Nickel Co.

F. B. Gotthardt, Chairman of the Sick Committee reports no sickness.

Membership Committee reports three prospective men for membership. Will report progress at the next meeting.

A letter from the Buffalo Branch A.E.S. reporting good progress for the National Convention to be held in Buffalo June 7-8-9, 1943, and asking for pictures or exhibits of plated materials for the display room. President McElroy has appointed A. R. McNeil to take charge of display arrangements.

A letter from the Detroit Branch regarding the Committee of Paper Awards. Dr. Walter R. Meyer will report at the next meeting.

A letter from Dr. Hutchinson of the Research Division of the Remington Arms Co. asking for information about joining the society and the benefits received. The secretary wrote Dr. Hutchin-

son giving the required information and enclosing application blanks in the letter.

A letter from J. H. Donahue, Secretary of the Regional Meeting Committee asking about progress of our advertising program. H. M. Goldman will make this report at Hartford, Conn., on March 20, 1943 at the next general meeting.

Change of name of the society. A motion was made and passed to table this discussion until the next meeting.

Bills against the Branch were ordered to be paid.

C. C. Helmle gave us a good report on the Educational Session being made up for the Regional Meeting at Hartford. Thtre is no question whatever that the Educational Session at the Regional Meeting in Hartford, Conn., May 1st, 1943 is going to be the "tops."

A. R. McNeil has asekd for cooperation from the members regarding the display for the convention.

The treasurer's report was read and accepted.

The Educational Session was in the form of motion pictures on "Mining and Refining of Nickel" and was conducted by our Librarian, C. C. Helmle. The pictures were good and were enjoyed by all the members present.

The meeting adjourned at 11:00 P.M.

JOSEPH G. STERLING, *Secy.-Treas.*

MONTREAL BRANCH

Montreal Branch held its first Stag Dinner at the Mount Royal Hotel on our usual meeting night, Monday, March 1st, 1943.

We had a wonderful attendance with practically 100% of our membership and a number of prospective members.

Mr. J. Reisenburg and Mr. T. Day devoted a great deal of their time to make this evening something to be remembered, with lots to eat and plenty to drink and enough entertainment to keep our minds off plating for one night.

We cannot overlook the service of the Hotel, it was all we could desire, and those Delegates who visited Montreal in 1925 know just what we mean.

The evening's entertainment was concluded with a final toast to the King.

EUG. FEELEY, *Secy.-Treas.*

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BOOK DEPARTMENT

BOOK REVIEWS

By

DR. GEORGE DUBPERNELL, *United Chromium, Inc.*

Aircraft Engine and Metal Finishes. MYRON A. COLER, 128 pages. Pitman Publishing Corporation, New York, New York, 1942. Price $1.50.

As stated by the author, this book is: "a brief description of current American practices employed in finishing the exterior surfaces of aircraft engines and similar parts." The emphasis is on an elementary discussion of the principles on which the procedures are based, and similarly to the book by R. C. Martin reviewed in April issue of MONTHLY REVIEW, this text is of value to the beginner more than to the expert in its special field. Most attention is devoted to organic finishes, but there is also some discussion of anodizing and various immersion treatments for metals, such as chromic acid dips, and phosphate and acid and alkaline dichromate treatments. There are forty-five excellent illustrations which aid the presentation considerably, and the book is well indexed. Much attention is devoted to the finishing of aluminum and magnesium alloys in addition to steel, as these metals are commonly used in aircraft construction.

(1) **Standard Handbook for Electrical Engineers.** Edited by A. E. KNOWLTON and R. M. SHOOK. 2303 pages. $8.00.

(2) **Cleaning and Finishing Metal Products.** Published by Iron Age. 235 pages, $3.00.

(3) **Modern Metallurgy for Engineers.** By FRANK T. SISCO. 432 pages, $4.50.

(4) **An Introduction to Electrochemistry.** By SAMUEL GLASSSTONE. 553 pages, $5.00.

(5) **Hardness and Hardness Measurements.** SAMUEL R. WILLIAMS. 558 pages. 1942. Price $7.50.

(6) **Lacquer and Synthetic Enamel Finishes.** RAY C. MARTIN. 526 pages. Price $5.50.

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MAURICE R. CALDWELL

Chairman, Membership Committee

To May, 1943

ELECTIONS

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FRANK L. DAVEY, Egyptian Lacquer Mfg. Co., Baltimore, Md., Associate

Boston Branch

ROBERT R. FLAHERTY, 22 Crescent St., Cambridge, Mass. (Reinstated)

Buffalo Branch

WILLIAM H. GRATZ, Houde Eng., Division and Prop. of Wrights Plating Works, Active

ELWOOD RAYMOND RINEHART, Boeing Aircraft Co., Renton, Wash., Active

EDWIN ROY BOWERMAN, JR., Sylvania Electric Products, Inc., Associate

RAYMOND HUBNER, Keystone Chrome Corp., Buffalo, N. Y., Associate

Cleveland Branch

FRED H. NIEHOFF, Advance Plating Co., Cleveland, Ohio, Associate

JOHN W. SPARANO, Woodhill Plating Co., Cleveland, Ohio, Active

Chicago Branch

R. V. MINER, 4068 Western Ave., Western Springs, Ill., Associate

Detroit Branch

WILLIAM E. BOETTCHER, The Udylite Corporation, 1651 E. Grand Blvd., Detroit, Mich., Associate

JACK LAWSON, Spradlin Sales & Mfg. Co., 1951 E. Ferry, Detroit, Mich., Associate

Grand Rapids Branch

MARTIN A. FELIX, Winters & Crampton Corp., Grandville, Mich.

F. G. CYREX, J. C. Miller Co., Grand Rapids, Mich.

WILLIAM THOMAS DARLING, Winters & Crampton Corp., Grandville, Mich.

RICHARD JAGER, Winters & Crampton Corp., Grandville, Mich.

NICHOLAS H. LANNING, Keeler Brass Co., Grand Rapids, Mich.

SIDNEY G. LAMMERS, Grand Rapids, Mich.

ALFRED GORDON LEE, Continental Aviation and Engineering Corp., Muskegon, Mich.

JACK LEHMOINE, Keeler Brass Co., Grand Rapids, Mich.

PETER C. MENDELS, Winters & Crampton Corp., Grandville, Mich.

ROBERT C. MEECH, Winters & Crampton Corp., Grandville, Mich.

RANSOM B. PERKINS, W. B. Jarvis Co., Grand Rapids, Mich.

Los Angeles Branch

FOREST BRAME, 951 Horley Ave., Downey, Calif., Active

F. CARL HIRDLER, JR., Turco Products, Inc., P.O. Box 2649 Terminal Annex, Los Angeles, Calif., Associate

Milwaukee Branch

THEODORE D. HARTSHORN, A. J. Lindemann & Hoverson Co., Milwaukee, Active

PAUL J. KLUBER, Northern Pump Co., Minneapolis, Active

New York Branch

BENJAMIN GALLO, 528 Riverside Drive, New York, N. Y., Active

WILLIAM F. GOURZONG, 1162 Sheridan Ave., Bronx, N. Y., Active

Philadelphia Branch

EMILIO J. MARRERO, Bendix Aviation Corp., c/o Heat Treat Office, 4700 Wissohickon Ave., Philadelphia, Pa., Associate

St. Louis Branch

LAYTON SCHNEIDER, 2300 Locust St., St. Louis, Mo., Active
R. E. COULSON, JR., 2300 Locust St., St. Louis, Mo., Active
FRANK CROSS, 516 So. Broadway, St. Louis, Mo., Active
V. R. FARLOW, Decatur Club, Decatur, Ill., Active
E. L. LORENER, 2145 Angelica, St. Louis, Mo.
J. A. ROLAND, 3129 Rolla Place, St. Louis, Mo.
P. K. YOUNG, 1851 So. 10th, St. Louis, Mo.
F. KOEBER, c/o Amertorp Co., St. Louis, Mo.
E. A. R. HUNLETH, 4415a Michigan Ave., St. Louis, Mo.
J. F. DAVIS, 1303 Oriole St., Venice, Ill.
E. F. ELDER, R.R. Box 10, Ferguson, Mo., Active
B. TUCKER, 2532a University St., St. Louis, Mo., Associate
J. C. PECORARO, 6568 Minerva St., St. Louis, Mo., Associate
L. J. CAMBRON, 2532 W. Sullivan, St. Louis, Mo., Associate
J. L. ELDER, 2323 University St., St. Louis, Mo., Associate
W. N. JESTER, 1529 Engleholm Ave., St. Louis, Mo., Associate
HOMER A. DOERR, 3909 Colonial Ave., St. Louis, Mo., Active
H. W. DOERR, 3905 Colonial Ave., St. Louis, Mo., Active
F. SHAW, Route No. 2, Chesterfield, Mo., Associate
B. G. ROBERTS, Fairmont Hotel, Maryland and Euclid, St. Louis, Mo., Active
FRED STARK, 3512 Chateau Ave., St. Louis, Mo., Active
CLARENCE STUDER, 2822 LaSalle St., St. Louis, Mo., Associate
ARTHUR LUBKER, 2515 Sullivan Ave., St. Louis, Mo., Active
FRANCIS FLACHS, 10314 Driver Ave., Overland, Mo., Associate
ELMER WESSEL, 1315 Hickory St., St. Louis, Mo., Associate
R. C. JONES, 1925 State St., Granite City, Ill., Active
DURWARD COOLEY, 2233a Washington Ave., Granite City, Ill., Active

San Francisco Branch

WESLEY PLUNKETT, 2350 Washington Ave., San Leandro, Calif., Associate

Springfield Branch

DANIEL CANZINO, 25 Massachusetts Ave., Pittsfield, Mass., Associate
DR. CESAR ROITMAN, Avda. De Mayo 1302-Bs. As., Buenos Aires, Argentina, Associate
FREDERICK G. WEBBER, 9 Federal St., Springfield, Mass.
JOHN M. JOHNSTON, 1002 Amostown Rd., W. Springfield, Mass., Associate
DONALD J. COUDERT, 63 Harvard St., Pittsfield, Mass., Associate
EDMUND F. WEISS, Housatonic St., Lenox, Mass., Associate
GEORGE A. MIARCHOS, 46 Edward Ave., Pittsfield, Mass., Associate

Toledo Branch

KEMSLEY L. ALLISON, 4016 Eastwat, Toledo, Ohio, Associate

Toronto Branch

W. H. SLOMAN, 2 Larchmount Ave., Toronto, Canada, Associate

Waterbury Branch

EDWARD J. GARLAND, 31 New Street, Naugatuck, Conn., Associate
CLINTON W. DAVISSON, Atkins Street, Middletown, Conn., Associate

APPLICATIONS

Baltimore-Washington Branch

WILLIAM PAUL COUPER
DAN ENO
JACK MICHAEL SANTANGELO
EVERETT S. STONE

Chicago Branch

C. F. HANSEN, 1039 Hollywood Ave., Chicago, Ill., Associate
W. C. BRYAN, 2824 N. Sheridan Road, Chicago, Ill., Associate

Cincinnati Branch

HERMAN ROY ENGELS, Wrights Aero Corp., Cincinnati, Ohio, Associate
M. L. HAHN, Oakite Products Inc., Cincinnati, Ohio, Associate
JOHN HALE MATZGER, Turco Products, Inc., Cincinnati, Ohio, Associate
HOWARD M. RUSSELL, Cincinnati Plating Co., Covington, Ky., Associate
HAROLD L. SENDELBACH, Wright Aero Corp., Cincinnati, Ohio, Associate

Cleveland Branch
STANLEY L. ATMA, Barker Products Co., Cleveland, Ohio, Associate
FREDERICK G. BARKER, JR., Barker Products Co., Cleveland, Ohio, Associate
CLARENCE H. MEYER, Acme Plating Co., Cleveland, Ohio, Active
JOSEPH SALETEL, Acme Plating Co., Cleveland, Ohio, Active

Detroit Branch
JOHN E. HUNT, Active
C. NORRIS, Active

Grand Rapids Branch
SIDNEY G. LAMMERS, Winters & Crampton Co., Grandville, Mich.
ALFRED GORDON LEE, Continental Aviation Corp., Muskegon, Mich.

Montreal Branch
EDMOND DESBIENS, R.C.A. Victor, Montreal, Active
FRANK L. GEOFFRE, R.C.A. Victor, Montreal, Active
HENRY GOERNERT, Enco Mfg. Co., Ltd., Montreal, Associate

Newark Branch
WILLIAM H. HAYFORD, JR., Associate
VICTOR G. MICHAELS, Associate
JEROME C. WADE, Walter Kidde, Inc., Active

New York Branch
P. JOSEPH CURCIO, W. L. Maxson Corp., New York City, Associate
THOS. F. KNECHT, Sperry Gyroscope Co., Brooklyn, N. Y., Associate
JOHN B. STAPLEFORD, Sperry Gyroscope Co., Bloomfield, N. J., Associate
MICHAEL D. NOGA, Star Metal Product, Brooklyn, N. Y., Active
MURRAY A. ABBEY, Atlantic Lacquer Co., Irvington, N. J., Associate

Springfield Branch
FRANK J. SWORDS, 109 Lyman St., Holyoke, Mass., Associate

TRANSFERS

EDWIN J. SMITH from Detroit Branch to Cleveland Branch
C. H. STODDARD from Chicago Branch to Cleveland Branch
W. J. ROBINSON from Hartford Branch to Springfield Branch
JACK WISEMAN from Grand Rapids Branch to Los Angeles Branch
J. H. MONAWECK from Detroit Branch to Chicago Branch
CHESTER BORLET from Detroit Branch to Buffalo Branch

RESIGNATIONS

SAMUEL JOHNSON, Hilltop Circle, Nichols, Conn., Bridgeport Branch

Detroit Branch
RICHARD FLANIGAN, 15110 Appoline, Detroit, Mich.
WILBUR E. SMITH, 18810 Bungalow Drive, Lathrop Twp., Birmingham, Mich.
EDWARD WITTHOFF, 14227 Promenade, Detroit, Mich.

DEATHS

JOHN W. HIMES, Philadelphia Branch
HARRY SEIMER, St. Louis Branch
PAUL KRAUSE, Milwaukee Branch

SUSPENSIONS

Cleveland Branch
PHILIP H. BROTZMAN

Lancaster Branch
HAROLD FISHER
CLAIR COOKE
WILLIAM BAIRD McCOMSEY
RAYMOND NISSLEY

Springfield Branch
ANTHONY DEGHELLO
RALPH E. FALES

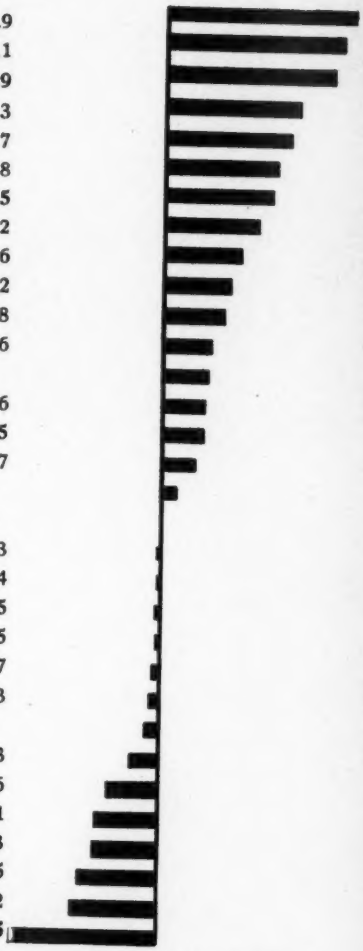
Dayton Branch
WARD B. PROTZMAN
ROBERT SKINNER
JOHN ALBAUGH
BETRAM B. FROMM
KENNETH E. HARRISON
JOHN COOL
CHAS. HERBY
WILLIAM DWYER

CHANGE IN STATUS

GEORGE J. MITCHELL, 72 Vine St., Dayton, Ohio, to Active Membership

MEMBERSHIP CHART

BRANCH	May 1942	Change in Membership	Percent Change
SYRACUSE	31	+10½	+33.9
CLEVELAND	81	+26	+32.1
CINCINNATI	42	+13	+30.9
ST. LOUIS	82	+20	+24.3
BUFFALO	55	+12½	+22.7
INDIANAPOLIS	48	+10	+20.8
BALT.-WASHINGTON	82	+16	+19.5
TORONTO	87	+15	+17.2
MONTREAL	44	+ 6	+13.6
NEWARK	156	+19	+12.2
WATERBURY	97	+10½	+10.8
GRAND RAPIDS	87	+ 7½	+ 8.6
ROCHESTER	80	+ 6	+ 8
SPRINGFIELD	72	+ 5½	+ 7.6
CHICAGO	258	+19½	+ 7.5
PITTSBURGH	52	+ 3	+ 5.7
PROV.-ATTLEBORO	49	+ 1	+ 2
*BINGHAMTON	16	...	...
LOS ANGELES	128	— ½	— .3
BOSTON	118	— ½	— .4
HARTFORD	67	— 3½	— .5
MILWAUKEE	97	— ½	— .5
NEW YORK	139	— 1	— .7
DETROIT	277	— 3½	— 1.3
NEW HAVEN	105	— 2	— 2
BRIDGEPORT	80	— 3½	— 4.3
PHILADELPHIA	142	—11	— 8.6
DAYTON	99	—11	—11.1
LANCASTER	44	— 5	—11.3
ANDERSON	38	— 5½	—14.5
TOLEDO	46	— 7	—15.2
SAN FRANCISCO	46	—12	—28.5



*Binghamton Branch has suspended. Members have been transferred to other Branches.

MEMBERSHIP – May 1st, 1943 = 2845
MEMBERSHIP – May 1st, 1943 = 2971
GAIN IN MEMBERSHIP = 126
Percent of Gain 4.4%

BUYERS' GUIDE

ABRASIVES

Divine Brothers Co., Utica, N. Y.
Harrison & Co., Haverhill, Mass.
Lasalco, Inc., St. Louis, Mo.
Lea Mfg. Co., Waterbury, Conn.
Norton Company, Worcester, Mass.
Roberts Rouge Co., Stratford, Conn.

ACTIVATED CARBONS

Darco Corporation, New York City
Industrial Chemical Sales, New York City

ALKALI CLEANING COMPOUNDS

Detroit Rex Products Co., Detroit, Mich.
Enthone Co., New Haven, Conn.
Gumm, Frederick, Chemical Co., Inc., Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
Oakite Products Inc., New York City
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Wyandotte Chemicals Corp., Wyandotte, Mich.

ANODES, ACIDS AND SALTS

Apothecaries Hall Co., Waterbury, Conn.
du Pont, E. I., de Nemours & Co., Inc., Wilmington, Del.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland. Ohio
Lasalco, Inc., St. Louis, Mo.
Preciment Laboratories, New York City
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

ANODES, ACIDS AND SALTS

Stevens, Frederic B., Inc., Detroit, Mich.
Stutz, George A., Mfg. Co., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

ANODES—CHROMIUM PLATING

Enthone Co., New Haven, Conn.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland Ohio
Heil Engineering Company, Cleveland Ohio
Lasalco, Inc., St. Louis, Mo.
McGean Chemical Co., Cleveland, Ohio
Seymour Mfg. Co., Seymour, Conn.
Stevens, Frederic B., Inc., Detroit, Mich
Storts Welding Co., Meriden, Conn.
Stutz, George A., Mfg. Co., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.
United States Stoneware Co., The, Akron, Ohio.

ANODES—COPPER

American Brass Co., Waterbury, Conn.
du Pont, E. I., de Nemours & Co., Inc., Wilmington, Del.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio
Lasalco, Inc., St. Louis, Mo.
McGean Chemical Co., Cleveland, Ohio
Seymour Mfg. Co., Seymour, Conn.
Stevens, Frederic B., Detroit, Mich.
Stutz, George A. Mfg. Co., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

ANODES—ELECTRIC CLEANER

Lasalco, Inc., St. Louis, Mo.
Storts Welding Co., Meriden, Conn.
Stutz, George A., Mfg. Co., Chicago, Ill

BUYERS' GUIDE

ANODES—NICKEL

Seymour Mfg. Co., Seymour, Conn.

ANODES—ZINC

du Pont, E. I., de Nemours & Co., Inc., Wilmington, Del.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio
Lasalco, Inc., St. Louis, Mo.
Meaker Company, The, Chicago, Ill.
Seymour Mfg. Co., Seymour, Conn.
Stevens, Frederic B., Inc., Detroit, Mich.
Stutz, George A., Mfg. Co., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

BALL ANODES

du Pont, E. I., de Nemours & Co., Inc., Wilmington, Del.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
Stutz, George A., Mfg. Co., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

BUFFS AND BUFFING COMPOSITIONS

Advance Polishing Wheels, Inc., Chicago, Ill.
Apothecaries Hall Co., Waterbury, Conn.
Burns, E. Reed, Corp., Brooklyn, N. Y.
Divine Brothers Co., Utica, N. Y.
Gumm, Frederick, Chemical Co., Inc., Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harrison & Co., Haverhill, Mass.
L'Hommedieu, Chas. F., & Sons, Co., Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.
Lea Mfg. Co., Waterbury, Conn.
MacDermid, Inc., Waterbury, Conn.
Matchless Metal Polish Co., Glen Ridge, N. J., and Chicago, Ill.
Puritan Mfg. Co., Waterbury, Conn.
Roberts Rouge Co., Stratford, Conn.
Stevens, Frederic B., Detroit, Mich.
The Buckingham Products Co., Detroit, Michigan

BUFFS AND BUFFING COMPOSITIONS

Stutz, George A., Mfg. Co., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.
United Laboratories, Linden, N. J.
The Buckingham Products Co., Detroit, Michigan

BURNISHING BARRELS AND BALLS

Abbott Ball Co., Hartford, Conn.
Baker, M. E., Co., Cambridge, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
Magnuson Products Corp., Brooklyn, N. Y.
Storts Welding Co., Inc., Meriden, Conn.

BURNISHING COMPOUNDS

Ford, J. B., Co., The, Detroit, Mich.
Gumm, Frederick, Chemical Co., Inc., Kearny, N. J.
Lasalco, Inc., St. Louis, Mo.
Magnus Chemical Co., Garwood, N. J.
Oakite Products, Inc., New York City

CADALYTE PLATING MATERIALS "CARBONATE REMOVER"

du Pont, E. I., de Nemours & Co., Inc., Wilmington, Del.
Lasalco, Inc., St. Louis, Mo.

CADMIUM SERVICE

Hanson-Van Winkle-Munning Co., Matawan, N. J.
Udylte Corp., The, Detroit, Mich.

CADUX MATERIALS

Hanson-Van Winkle-Munning Co., Matawan, N. J.

CEMENT—GLUE SUBSTITUTE

Harrison & Co., Haverhill, Mass.

BUYERS' GUIDE

CEMENT POLISHING WHEEL

Divine Brothers Co., Utica, N. Y.
Harrison & Co., Haverhill, Mass.
Lasalco, Inc., St. Louis, Mo.
Lea Mfg. Co., The, Waterbury, Conn.

CHROMIUM SERVICE

Hanson-Van Winkle-Munning Co., Matawan, N. J.
United Chromium, New York City

CLEANERS AND CHEMICALS

Apothecaries Hall Co., Waterbury, Conn.
Blakeslee, G. S., & Co., Chicago, Ill.
Detroit Rex Products Co., Detroit, Mich.
du Pont, E. I., de Nemours & Co., Inc., Wilmington, Del.
Enthone Co., New Haven, Conn.
Gumm, Frederick, Chemical Co., Inc., Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio
Lasalco, Inc., St. Louis, Mo.
Lea Mfg. Co., The, Waterbury, Conn.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
McGean Chemical Co., The, Cleveland, Ohio
Meaker Company, The, Chicago, Ill.
Merck & Co., Inc., Rahway, N. J.
Norton Co., Worcester, Mass.
Oakite Products, Inc., New York City
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Puritan Mfg. Co., Waterbury, Conn.
Stevens, Frederic B., Inc., Detroit, Mich.
Sulphur Products Co., Greensburg, Pa.
Udylite Corp., The, Detroit, Mich.
Wyandotte Chemicals Corp., Wyandotte, Mich.
Zialite Corporation, Worcester, Mass.

COILS—PLATING TANKS

Heil Engineering Company, Cleveland, Ohio
Lasalco, Inc., St. Louis, Mo.
Storts Welding Co., Meriden, Conn
United States Stoneware Co., The, Akron, Ohio.

DEGREASERS

Blakeslee, G. S., & Co., Chicago, Ill.
Detroit Rex Products Co., Detroit, Mich.
Mechanical Process, South Orange, N. J.
Phillips Mfg. Co., Chicago, Ill

EQUIPMENT

Alsop Engineering Corp., Milldale, Conn.
Blakeslee, G. S., & Co., Chicago, Ill.
Ceilcote Company, Cleveland, Ohio
Detroit Rex Products Co., Detroit, Mich.
Divine Brothers Co., Utica, N. Y.
Gumm, Frederick, Chemical Co., Inc., Kearny, N. J.
Hammond Machinery Builders, Kalamazoo, Mich.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Heil Engineering Co., Cleveland, Ohio
Industrial Filter & Pump Mfg. Co., Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.
Lea Mfg. Co., The, Waterbury, Conn.
L'Hommedieu, Chas. F., & Sons Co., Chicago, Ill.
Meaker Co., The, Chicago, Ill.
Mechanical Process Company, South Orange, N. J.
Miller, J. C., Company, Grand Rapids, Mich.
Paasche Airbrush Company, Chicago, Ill.
Packer Machine Co., The, Meriden, Conn.
Phillips Mfg. Co., Chicago, Ill.
Stevens, Frederic B., Inc., Detroit, Mich.
Storts Welding Co., Meriden, Conn.
Stutz, George A., Mfg. Co., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.
United Laboratories, Linden, N. J.
United States Stoneware Co., The, Akron, Ohio.

LEAD LINED TANKS

Hanson-Van Winkle-Munning Co., Matawan, N. J.
Heil Engineering Company, Cleveland, Ohio
Lasalco, Inc., St. Louis, Mo.
Storts Welding Co., Meriden, Conn.
Udylite Corp., The, Detroit, Mich.
United States Stoneware Co., The, Akron, Ohio.

BUYERS' GUIDE

MEAKER PROCESS GALVANIZING

Meaker Company, The, Chicago, Ill.

METAL LACQUERS AND FINISHES

Alrose Chemical Co., Providence, R. I.
Atlas Powder Co., Zapon Div., Stamford, Conn.
Egyptian Lacquer Mfg. Co., New York City
Heatbath Corporation, Springfield, Mass.
Maas & Waldstein Co., Newark, N. J.
New Wrinkle, Inc., Dayton, Ohio
Preciment Laboratories, New York City

METAL WORKING LUBRICANTS

Magnus Chemical Co., Garwood, N. J.
Oakite Products, Inc., New York City

OXIDIZING AGENTS

Enthone Co., New Haven, Conn.
Lasalco, Inc., St. Louis, Mo.
Mitchell-Bradford Chemical Co., Bridgeport, Conn.
Puritan Mfg. Co., Waterbury, Conn.
Sulphur Products Co., Greensburg, Pa.

PLATING BARRELS

Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
Lea Mfg. Co., The, Waterbury, Conn.
Stevens, Frederic B., Inc., Detroit, Mich.
Stutz, George A., Mfg. Co., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

PLATING TANKS

Hanson-Van Winkle-Munning Co., Matawan, N. J.
Heil Engineering Company, Cleveland, Ohio
Lasalco, Inc., St. Louis, Mo.
Stevens, Frederic B., Inc., Detroit, Mich.
Storts Welding Co., Meriden, Conn.

PLATING TANKS

Enthone Co., New Haven, Conn.
Stutz, George A., Mfg. Co., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.
U. S. Stoneware Co., New York City

POLISHING LATHES

Baker, M. E., Co., Cambridge, Mass.
Divine Brothers Co., Utica, N. Y.
Gumm, Frederick, Chemical Co., Inc., Kearny, N. J.
Hammond Machinery Builders, Kalamazoo, Mich.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu, Chas. E., & Sons Co., Chicago, Ill.
Stevens, Frederic B., Detroit, Mich.
Stutz, George A., Mfg. Co., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

PLATING—PRECIOUS METALS

Baker & Co., Inc., Newark, N. J.
Merck & Co., Rahway, N. J.
Spectranome, New York City

POLISHING WHEELS AND MATERIALS

Advance Polishing Wheels, Inc., Chicago, Ill.
Baker, M. E., Co., Cambridge, Mass.
Burns, E. Reed, Brooklyn, N. Y.
Divine Brothers Co., Utica, N. Y.
Gumm, Frederick, Chemical Co., Inc., Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu, Chas. E., & Sons Co., Chicago, Ill.
Matchless Metal Polish Co., The, Glen Ridge, N. J., and Chicago, Ill.
Miller, J. C., Co., Grand Rapids, Mich.
Puritan Mfg. Co., Waterbury, Conn.
Roberts Rouge Co., Stratford, Conn.
Stevens, Frederic B., Detroit, Mich.
Stutz, George A., Mfg. Co., Chicago, Ill.
The Buckingham Products Co., Detroit, Michigan
Udylite Corp., The, Detroit, Mich.
United Labortories, Linden, N. J.

BUYERS' GUIDE

ROUGES

Divine Brothers Co., Utica, N. Y.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harrison & Co., Haverhill, Mass.
Lasalco, Inc., St. Louis, Mo.
Matcheless Metal Co., Glen Ridge, N. J.
Roberts Rouge Co., Stratford, Conn.
Stevens, Frederic B., Detroit, Mich.
The Buckingham Products Co., Detroit, Michigan
Udylite Corp., The, Detroit, Mich.

RUBBER-LINED TANKS

Heil Engineering Co., Cleveland, Ohio
Lasalco, Inc., St. Louis, Mo.
Storts Welding Co., Meriden, Conn.
United States Stoneware Co., The, Akron, Ohio.

SOAPS

Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lea Mfg. Co., The, Waterbury, Conn.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
Oakite Products, Inc., New York City
Udylite Corp., The, Detroit, Mich.

SOLUTION CONTROL METHODS

du Pont, E. I., de Nemours & Co., Inc., Wilmington, Del.
Hanson-Van Winkle-Muning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.

SOLVENTS—DEGREASING

Blakeslee, G. S., & Co., Chicago, Ill.
Detroit Rex Products Co., Detroit, Mich.
Lasalco, Inc., St. Louis, Mo.
Lea Mfg. Co., The, Waterbury, Conn.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Garwood, N. J.
Mechanical Process Co., South Orange, N. J.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Phillips Mfg. Co., Chicago, Ill.
Westvaco Chlorine Products Corp., New York, N. Y.

SOLVENTS RECOVERED

A. B. C. Chemical Co., Waterbury, Conn.

STRIPPING COMPOUNDS

Detroit Rex Products Co., Detroit, Mich.
du Pont, E. I., de Nemours & Co., Inc., Wilmington, Del.
Enthone Co., New Haven, Conn.
Gumm, Frederick, Chemical Co., Inc., Kearny, N. J.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
Oakite Products. Inc., New York City
Sulphur Products Company, Inc., Greensburg, Pa.

TESTING INSTRUMENTS

American Instrument Co., Silver Spring, Md.
du Pont, E. I., de Nemours & Co., Inc., Wilmington, Del.
Harshaw Chemical Co., The, Cleveland, Ohio
Industrial Filter & Pump Mfg. Co., Chicago, Ill.
Kocour Co., Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.

TUMBLING BARRELS

Abbott Ball Co., Hartford, Conn.
Baker, M. E., Co., Cambridge, Mass.
Lasalco, Inc., St. Louis, Mo.
Storts Welding Co., Meriden, Conn.

UDYLITE CADMIUM SERVICE

MacDermid, Inc., Waterbury, Conn.
Udylite Corp., The, Detroit, Mich.

USED EQUIPMENT

Baker, M. E., Co., Cambridge, Mass.

WASHERS—METAL PARTS

Blakeslee, G. S., & Co., Chicago, Ill.
Detroit Rex Products Co., Detroit, Mich.

BRANCH DIRECTORY

ANDERSON meets second Tuesday of every month at 7:30 p.m., at the Y. M. C. A. Anderson, Indiana. Secretary-Treasurer, E. L. McKinney, 2014 Fairview St., Anderson, Ind.

BALTIMORE-WASHINGTON meets at the Telford Buffeteria, 14th and Decatur Sts., N.W. Washington, D. C., the first Saturday of each month. Secretary-Treasurer, Abner Brenner, 6509 Fulton St., Chevy Chase, Md.

BINGHAMTON Secretary-Treasurer, Austin Fletcher, 406 Conklin Ave., Binghamton, N. Y.

BOSTON meets at the Hotel Statler, Boston, Mass., first Thursday each month. Secretary, A. W. Garrett, 77 Neponset Ave., Dorchester, Mass.

BRIDGEPORT meets first Friday of each month at Chamber of Commerce Rooms, Stratfield Hotel, Secretary-Treasurer, Joseph G. Sterling, 134 Colony St., Bridgeport, Conn.

BUFFALO meets second Friday of each month at Hotel Statler; Buffalo, N. Y. Secretary J. C. Mays, c/o Carborundum Co., Niagara Falls, N. Y.

CHICAGO meets second Friday of each month at 8 p.m., Atlantic Hotel, 316 S. Clark St. Secretary, J. W. Hanlon, 3004 N. Whipple St., Chicago, Ill.

CINCINNATI meets on Fourth Thursday of each month at 8 p.m., at Hotel Gibson, Cincinnati, Ohio. Secretary, Alcide E. Foreman, Rt. 9, Van Zandt Road, Box 313, Cincinnati, Ohio.

CLEVELAND meets first Saturday of each month at Cleveland Hotel. Secretary-Treasurer, G. B. Svenson, c/o Plater Supply, 2059 Hamilton Ave., Cleveland, Ohio.

DAYTON meets second Friday of each month at the Engineers Club, Dayton, Ohio. Secretary-Treasurer, W. M. Durnbaugh, R. R. 4 Xenia, Ohio.

DETROIT meets the first Friday of each month at the Hotel Statler. Acting Secretary-Treasurer, Wright M. Wilson, 1570 Anita Ave., Grosse Point Woods, Mich.

GRAND RAPIDS meets second Friday of each month, 7:30 p.m., at the Browning Hotel. Secretary-Treasurer, C. E. Abel, 11 Scribner Ave., N.W., Grand Rapids, Mich.

HARTFORD meets third Monday of each month alternately at Hartford Electric Light Company, Hartford and at the Elks Club, corner South and Main Sts., Bristol, Conn. Special meetings are held at the New Britain Trade School, New Britain, Conn. Secretary-Treasurer, Kenneth Bellinger, 16 Mountain View Drive, Newington, Conn.

INDIANAPOLIS meets at the Hotel Riley, the first Wednesday of each month. Secretary-Treasurer, W. W. Cothran, 5242 Boulevard Place, Indianapolis, Ind.

LANCASTER meets second Friday of each month at 8 p.m., at Thaddeus Stevens Industrial School, Lancaster, Pa. Secretary-Treasurer, W. H. Fordney, 603 Marietta Ave., Lancaster, Pa.

LOS ANGELES meets second Wednesday of each month at 6:30 p.m., at the Elks Club, 607 S. Parkview, Los Angeles. Secretary-Treasurer, C. C. McLaren, 2236 Charnwood, Los Angeles, Calif.

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NEWARK meets first and third Friday of each month at Hotel Robert Treat, Newark, N. J., at 8 p.m. Secretary-Treasurer, George Wagner, 1130 So. Long Ave., Hillside, N. J.

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PITTSBURGH meets first Thursday of each month, at 8 p.m. at the Bureau of Mines Building, 4800 Forbes St., Pittsburgh, Pa. Secretary-Treasurer, Frank Keller, 1102 Hiland Ave., Corapolis, Pa.

PROVIDENCE-ATTLEBORO meets at the Providence Biltmore Hotel the third Monday of each month. Secretary-Treasurer, Frederick E. Allen, 260 Fair Street, Edgewood Station, R. I.

ROCHESTER meets third Friday of each month at the Hotel Seneca. Secretary-Treasurer, Donald C. Blum, 672 Mt. Read Blvd., Rochester, N. Y.

SAN FRANCISCO meets second Thursday of each month at Progressive Plating Works, 881-27th St., Oakland. Secretary-Treasurer, C. R. Macdonald, 5363 Shafter Ave., Oakland, Calif.

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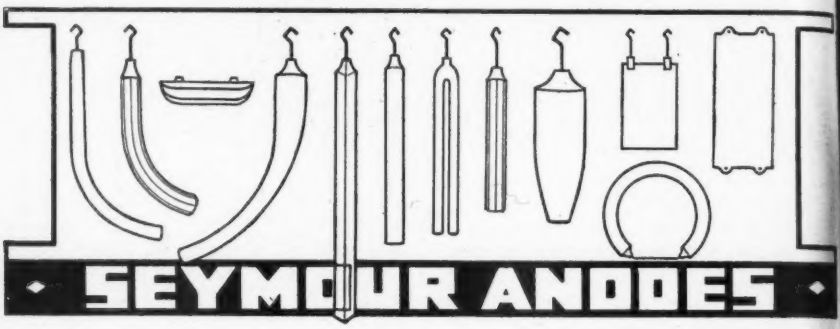

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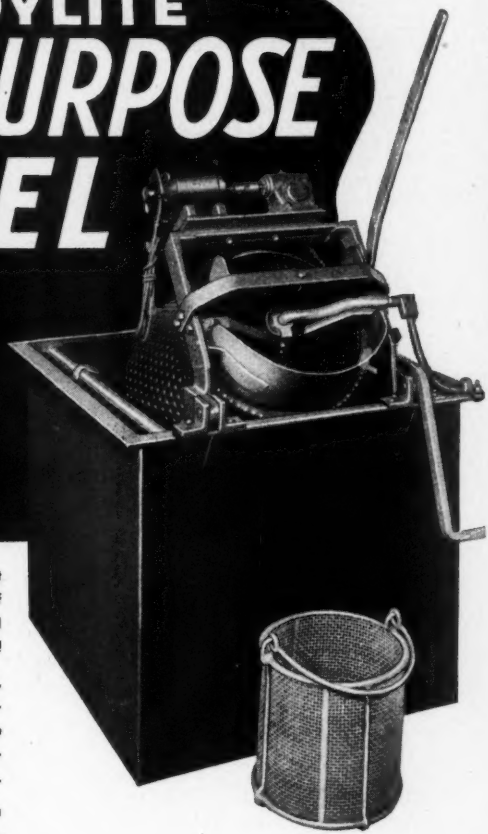

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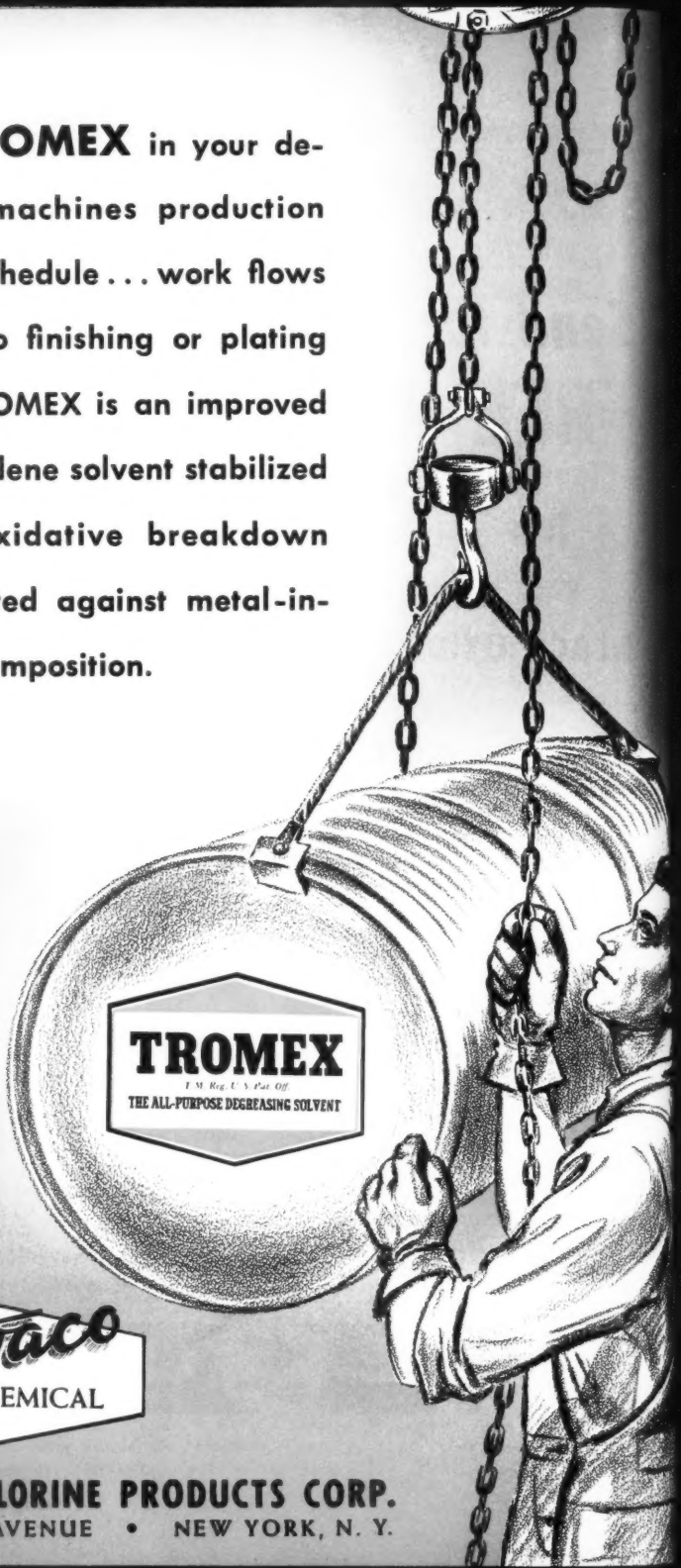

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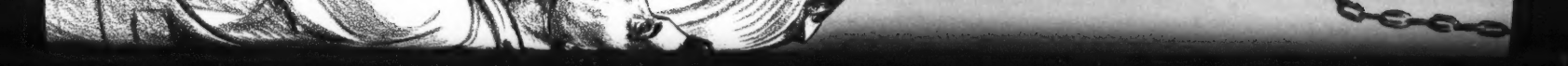

VISION

By E. T. CANDEE

Acting Secretary

BY the time this issue of the Review is received, the 31st Annual Convention of the American Electroplaters' Society will be past history. The papers presented at the Convention cover the widest range of subjects ever discussed at a Convention, and the quality of the papers indicates success with which the members are tackling the broader problems presented under war conditions.

The metal finishing industry will expand in proportion to the effort and vision that the members apply to their problems and the Convention is an excellent indication that the industry has not become stagnant. The new officers have had an active part in the Society long enough to warrant the confidence of the members in the details of their administration, and it is expected that although not as many major changes may be required this year as last year, decisions will be rendered as called for to promote the Society in all its phases.

The success of the technical side of the Convention fully justifies the decision of the officers that meetings between the members of the A.E.S. furnish a useful function toward the war effort and it is hoped that groups in either the branch meetings, regional meetings, or Convention will continue to get together to solve their mutual problems. New products and processes which are being developed are most easily described in such meetings and through the pages of the Monthly Review, and the restriction of travel, particularly on the Eastern Seaboard, will force the Society to furnish this ever important function. Let us make use of our opportunity to use the Society in any way it can properly function.

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